

APRIL  
1954

# chemical processing

*for men who manage*

*highly*

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hence more READER ACTION

SHELL'S AROMATICS UNIT  
Confirms Efficiency of Grid Tray Columns  
(See article, page 6)

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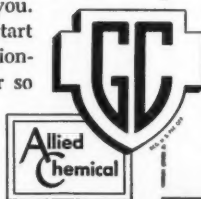
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When inquiring check CP 7470 on handy form, pgs. 2-3



# chemical processing

(CHEMICAL PROCESSING PREVIEW)

For MEN WHO MANAGE

Vol. 17

April, 1954

No. 4

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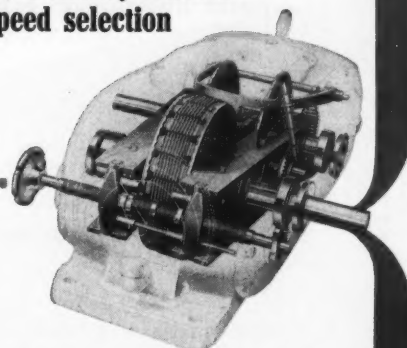
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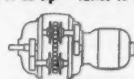
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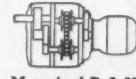
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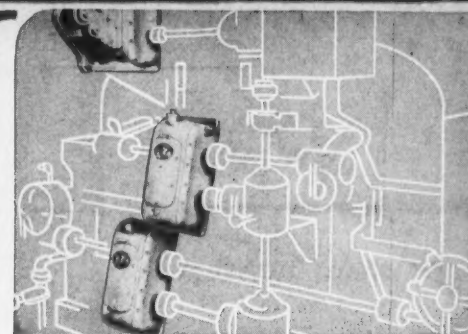
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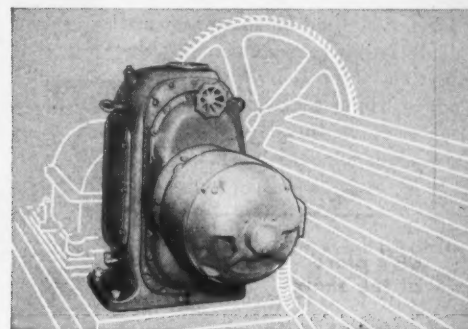
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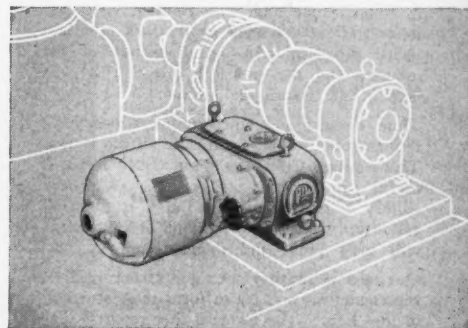
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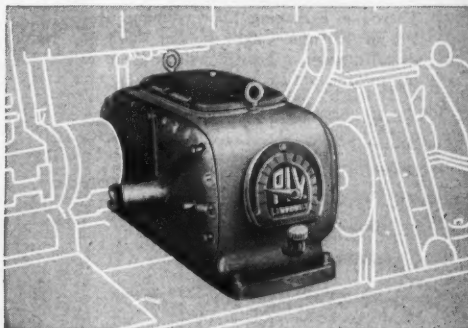
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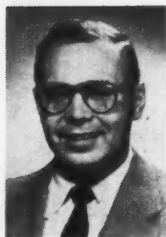
When inquiring check CP 7471 on handy form, pgs. 2-3

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## CP's place at the show



Among the best sources of information on new developments in the chemical industry are the various trade expositions held throughout the year. Here, at first hand, it is possible to compare one item with another, view new items and see extended applications of established products. An overall picture of the industry and the probable direction it will take in the future are indicated.

Time, distance and other considerations make it impossible for anyone to see all the shows. That's where CHEMICAL PROCESSING serves a useful function for its readers. We have editors in the field whose job it is to bring back from these shows the kind of stories that will most profit and interest our audience.

Our men know they are there as our readers' representatives and try to focus their attention in that light. The material they report is put on a Procrustean bed of reader interest. Being human, ergo fallible, we don't always give things the emphasis they deserve, but we do our best.

There's a Packaging Show coming up April 5-8 in Atlantic City. If you don't get to make it, you can bet CP will be there gathering information for you.

*Richard J. Callahan*

ASSISTANT EDITOR

## editorial sections

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1. When you want more information on processes, controls or developments of products discussed in this issue, see Reader Service slip opposite page 2

2. If you are looking for information on specific products, use the Product Director "Quick-locator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references 213

3. If you want to subscribe to this magazine, see reader-qualification form opposite page 3

## Unit Operations Applies to Pilot Plant Studies

J. C. DART, Manager  
Research & Development Division  
Houdry Process Corporation



Mr. Dart received his BA from Albion College, Michigan. He holds BS and MS degrees in Chemical Engineering from University of Michigan. Prior to joining the Houdry organization, Mr. Dart served in various capacities as chemical engineer with several petroleum companies. He was also an instructor in Chemical Engineering at the A & M College of Texas. In 1947, he joined

the Houdry Process Corporation as Director of Development Department, and in February, 1952 he was appointed to his present position.

Mr. Dart is the holder of several patents in the fields of alkylation, hydrocarbon synthesis, and catalytic cracking. He is the author of many papers on this last subject. An active member of the AIChE, having served for the past eight years as a member of the National Program Committee, he also holds memberships in the ACS and the American Society of Engineering Education. During the years 1951 to 1953, Mr. Dart served as a member of the Editorial Advisory Board of Putman Publishing Company.

The role of the pilot plant in process development is to provide reliable proof of the economic and operational feasibility of the process, to develop optimum processing steps and conditions, and to furnish engineering data for design of the commercial unit.

The only justification for by-passing the pilot plant is one of economics. Capital risk taken is balanced against the chance of increased profits by proceeding immediately to commercial operation.

In the development of new processes it is generally unwise to completely by-pass the pilot plant. The objective should be to obtain the maximum quantity of useful information of the required precision with a minimum expenditure of time and money. Millions of dollars are being spent each year by process industries in design, construction, and operation of pilot plants. It has been estimated that the petroleum industry alone now spends about 30 million dollars annually for pilot plant studies. Costs such as these pose the question, "Do our pilot plant programs justify large expenditures?" For an affirmative answer to this question, Research and Development must apply the most modern techniques known and thus reduce time and cost required to carry a process to commercialization. After the decision has been made that a pilot plant program is justified, the next and most important step is the "how" of this program.

Chemical engineering uses effectively the concept of unit operations. In this approach to chemical engineering it has been found advantageous to group functional operations such as distillation, fluid flow, heat flow, etc., and then analyze each unit operation. Design information and operating performances are obtained by the application of fundamental principles

(Continued on page 196)

# Jefferson...

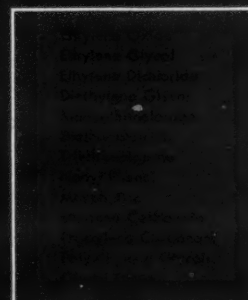
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## Briefs

### From recent literature

No. 6 in a Series

**Lubricating grease compositions** which are resistant to the solvent action of low boiling hydrocarbons are prepared by replacing the water of an inorganic hydrogel (e.g., silica gel) with ethylene glycol. After the ethylene glycol is added to the hydrogel, the gel is mixed in a steam-heated mill to evaporate the water and reduce particle size.

**Sterilization of air** to kill bacteria, viruses and molds is accomplished by introducing vapors of ethylene glycol into ventilation systems.

**Paper coatings** which are flexible and grease-proof are prepared from emulsions of plasticized polyvinyl acetates. These emulsions consist of a monoester of a glycol such as diethylene glycol, and an abietic acid having a terminal hydroxyl group.

**Fiber-forming polyesters** are produced by reacting ethylene glycol and a dicarboxylic acid. The reaction takes place at reduced pressures and elevated temperatures. These polyesters may be also used as softening agents, coatings, and film-forming substances.

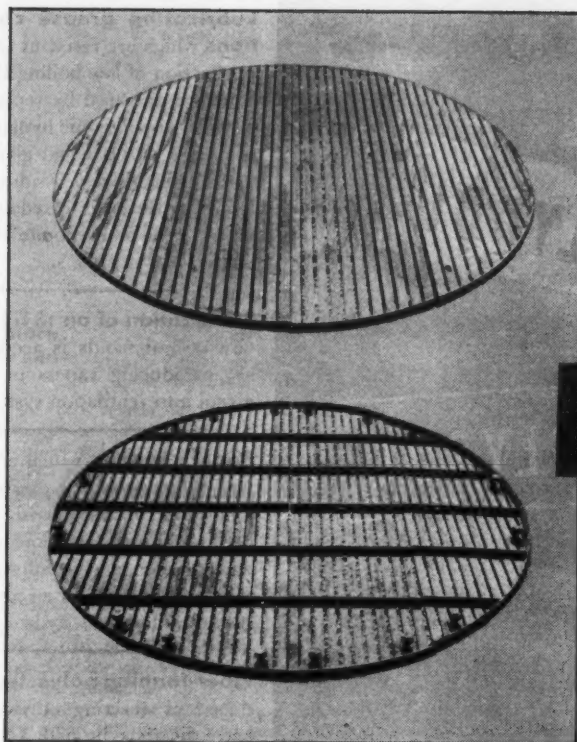
**Abrasive suspensions** for grinding or polishing various types of hard materials can be prepared by suspending small particles of silicon carbide, aluminum oxide or other abrasives in a medium consisting of a fatty acid ester of ethylene glycol.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Jefferson Ethylene Glycol and Diethylene Glycol in your products or processes.

When inquiring check CP 7472 on handy form, pgs. 2-3



*new solutions  
of processing problems*



Typical Turbogrid tray



Platforming-recovery unit of Shell Oil Co. at Houston is believed to be the only one of its type in the world producing pure benzene and toluene

**Higher capacity, excellent separation efficiency  
of grid tray columns confirmed by —**

## *Shell's aromatics unit*

**One year's satisfactory operation of Houston plant having 100% grid trays reaffirms their value, also shown by typical example of deethanizer column at another plant where throughput was increased 48% for the same separation**

**Problem:** Although conventional bubble cap trays are widely used in distillation operations, they have disadvantages. The use of separate compartments for vapor and liquid flow increases size and complicates construction. The large amount of metal in the plate assembly makes use of corrosion resistant alloys very expensive. Moreover, production bottlenecks in many plants could be removed by replacing bubble cap trays with higher capacity trays.

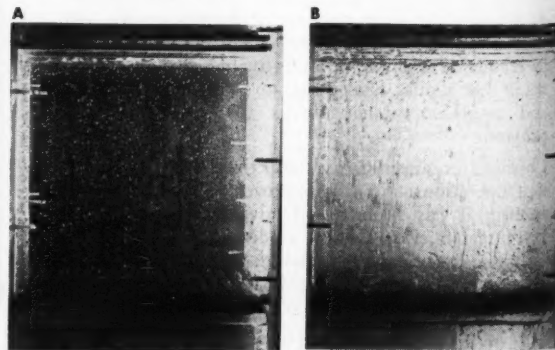
Plugging has also been encountered in some bubble cap tray installations within three or four months. Construction of this type of tray made them difficult to clean. Length of tray life, which varies according to metal used and operating conditions, has been only one year in some cases. Intricate design of bubble trays added to fabrication and installation costs.

**Solution:** As an outgrowth of the research by its associates in Holland during the war years, Shell Oil Company and Shell Development Company continued the development of a simpler type of tray. Preliminary testing of flat slotted trays was undertaken in laboratory. Work was soon moved to a plant-size re-run column, where much of the development work was accomplished. Result of the research was the Turbogrid distillation tray.

Tray is usually made of stamped plates, with welded bars running across face to serve as a stiffener. Plate can be a single unit or several

units can be fitted together. Thickness of plates usually varies from 1/16 to 1/8". Width of slot ranges from 1/8 to 1". Free area is really what counts. It ranges from 10 to 35%, depending on design.

After satisfactory operation in experimental unit,



grid tray  
Shell an  
refinerie  
one year  
producti  
tion in a  
refinery  
10-1/2'  
rated on  
benzene

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the plat  
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toluene.

**Results:**  
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grid trays were installed in individual columns at Shell and later in towers at a number of other refineries and chemical plants. Approximately one year ago, the platforming-recovery plant for production of aromatics, a 100% grid tray installation in all 14 towers, went on stream at company's refinery near Houston. Columns range up to 10-1/2' in diameter and 163' in height. Yearly rated output of plant is 18 million gallons of benzene and 35 million gallons of toluene.

Section of plant containing the shorter towers is used for preparing the light hydrocarbon feed for the platforming reactors. Taller towers are used for extractive distillation of product from platforming operation to recover pure benzene and toluene.

**Results:** High recovery and efficiency obtained through use of grid trays has been confirmed by satisfactory operation of the Shell aromatics unit since it went on stream in the spring of 1953. Use of grid trays permits smaller columns than would otherwise have been necessary to obtain same production and efficiency.

Although complete operating data on the Shell aromatics unit are not available at this time, typical examples of results achieved with grid trays at two other plants can be given. In one case 30 Turbogrid trays replaced 22 bubble trays in a deethanizer column. Up to 7400 bbl a day was processed with grid tray installation, while with bubble cap trays, efficiency deteriorated at feed rates in excess of 5000 bbl per day. In addition to this 48% increase in throughput, a 10% greater recovery of ethylene was obtained in tops.

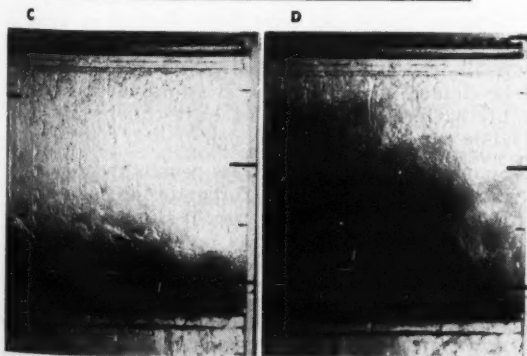
At another plant 19 grid trays replaced 14 bubble cap trays in a depropanizer column. Loss of 1.1% propane was reduced to 0.7% and butane loss was reduced by about the same proportion.

Within a normal operating capacity range, an individual grid tray does not have any greater

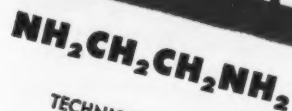
(Continued on next page)

Laboratory test in which air was bubbled through water on grid tray one sq ft in area to illustrate optimum operating rate

- A Two dry trays in place
- B At low rate, liquid may run through grid
- C Good contact between vapor and liquid
- D Close to flood point



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Color—APHA (Maximum).....	25
Flash Point (Open Cup Approx.).....	150°F
Weight Per Gallon.....	8.03 Pounds

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# • Davison Bulletin •

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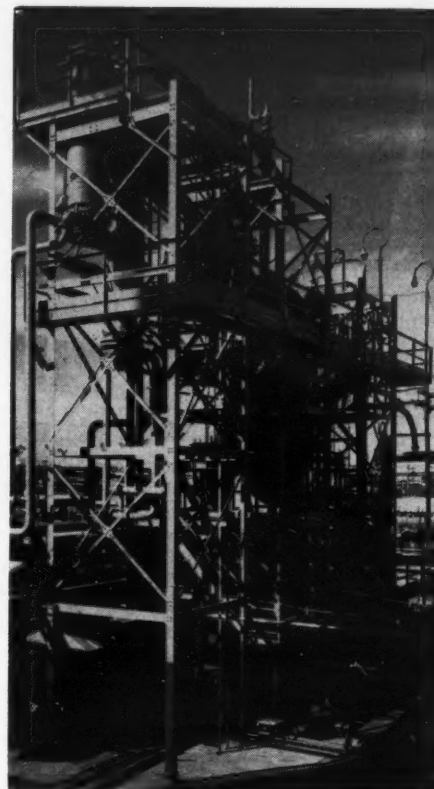
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## NEW SOLUTIONS of processing problems

(Continued from preceding page)

efficiency than a bubble tray. However, more grid trays can be placed in a given column, resulting in improved performance. While usual spacing between bubble cap trays is 24", grid trays can be placed as close together as 6". Usual minimum distance is 12" although spacing averages 18" in most installations.

One frequent use of grid trays in a refinery is to remove a bottleneck by increasing the capacity of a limiting column. In other cases where capacity is satisfactory, a required increase in separation efficiency in any one column may be obtained through use of grid trays.



Much of the development work on the grid tray was done in this plant-size hydrocarbon unit

Whereas bubble cap trays have plugged in three or four months, grid trays have shown only a small deposit in same period. Grid trays can also be cleaned more easily. It is estimated that tray life has been doubled at no extra cost by use of alloy metals in the grid design.

Simplified design of grid trays permits them to be economically fabricated. Turbogrids are also easier to install. In typical cases it has been found that the cost of a grid tray installation is 60 to 80% that which it would have been if bubble cap trays were used.

One factor that must be considered in the use of grid trays is that the operating range cannot be

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varied as much as with bubble cap trays. If rate becomes too low, vapor will not disperse in liquid.

(Technical paper on Turbogrid trays was presented at the December meeting of the American Institute of Chemical Engineers in St. Louis.)

(More information on Turbogrid trays may be obtained from Shell Development Company, Dept. CP, 50 West 50th St., New York 20, N. Y. . . . check CP 7475 on handy form, pages 2 and 3.)

#### Routine screen plate replacement eliminated in paper company . . .

costs are cut and production no longer suffers

**Problem:** Parsons Paper Company, Holyoke, Mass., had to replace the screen plates on its Bird screening machinery every three years, because they were badly pitted and corroded from the acid solution they were handling. The plates were made of phosphor bronze and were 100" long x 12-3/16" x 1/8". Screening slots ranged in width from .010" to .022", depending on the grade of paper being manufactured.

In operation, dirt, lumps, strings, and other foreign matters are removed from an ionized aluminum sulphate solution containing the cellulose fibers, which later make the paper sheets. Normal pH range is 4.2 to 4.8, with a temperature of 75 to 100°F. The cylinder on which the plates are mounted rotates in the vat containing solution. Acceptable fibers pass through from outside to the inside.

Not only were replacement costs mounting, but production also suffered because of downtime.

**Solution:** The company substituted Inconel screen plates for the phosphor bronze plates.

**Results:** After three years of operation, Inconel plates show no slot wear, no pitting, and no corrosion. They are doing as good a job of screening as they were at the start. Production has not suffered and screen replacement costs have been eliminated.

(Inconel screen plates are product of the Union Screen Plate Company, Dept. CP, Fitchburg, Mass. . . . check CP 7476, pages 2 and 3.)

#### Describes automatic pH control

Instrumentation data sheet describes continuous dry feed system for automatically controlling pH in water treatment, industrial waste disposal, or similar processes. Essential elements of such a system, installation and operation, and advantages are pointed out.

Instrument Data Sheet 9.6-5a, is available from Industrial Division, Minneapolis-Honeywell Regulator Company, Dept. CP, Wayne and Windrim Avenues, Philadelphia 44, Pa. When inquiring specify CP 7477, pages 2 and 3.

## IN INDUSTRIAL OILS AND FATTY ACIDS . . .



# SWIFT

does nature two better

Oleic Acid (Red Oil)  
Animal Fatty Acids  
Vegetable Fatty Acids  
Stearic Acids  
Hydrogenated Fatty Acids & Glycerides  
Larex (Swift's Lard Oils)  
Neatex (Swift's Neat's-foot Oils)  
Spermex (Swift's Sperm Oils)  
Spermaceti U. S. P.  
Monoglycerides  
Sulfonated Oils  
Wool Oils  
Anti-Foam Agents  
Glycerine  
Tallow  
Palmex (for Steel Mills)

● In producing industrial oils and chemicals, Swift does nature *one* better. In producing them with modern equipment under the strictest and most professional laboratory and production control, Swift does nature *two* better.

Through extensive plant facilities in Hammond, Indiana, Harrison, New Jersey, and Chicago, Illinois, Swift oils and fatty acids are manufactured from animal, vegetable and marine sources. Because of these facilities and experienced personnel, Swift engineers are able to derive the *most* from the raw materials with which they work. The result? . . . a variety of versatile, quality products and product combinations to meet a wide variety of specialized needs.

Yes, in manufacturing industrial oils and chemicals, Swift does nature *one* better—but it is because Swift *makes* Swift products that you can depend upon their quality . . . and can *rely* on Swift for your industrial oil and fatty acid needs.

Why not check your requirements from the list at the left? Use the coupon below to obtain further information.

#### ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

#### USE THIS COUPON FOR FURTHER INFORMATION

● Swift & Company, Industrial Oils Dept.  
● 1830 165th Street  
● Hammond, Indiana

Please send data on the following products:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

● Name \_\_\_\_\_ Title \_\_\_\_\_

● Company \_\_\_\_\_

● Address \_\_\_\_\_

● City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



Another of Swift's  
Products for Industry

When inquiring check CP 7478 on handy form, pgs. 2-3

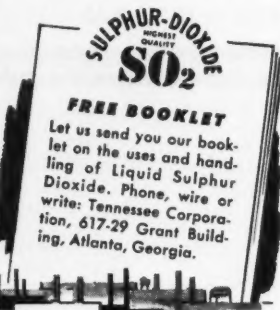


## SOLVING MANY PROBLEMS!

Perhaps your industry has a particular process that requires a superior reducing or bleaching agent, preservative, antichlor, pH control, or neutralizer. Tennessee's highest quality Sulphur Dioxide will fit the need. In most operations, the use of this chemical ( $\text{SO}_2$ ) with its manifold uses results in more efficiency and increased economy. We can supply Tennessee's highest quality Sulphur Dioxide in cylinders, ton drums, tank cars, and tank trucks. Let our technical experts show you how you might employ it to your greatest advantage.

### CONTAINERS

- Cylinders
- Ton Drums
- Tank Trucks
- Tank Cars

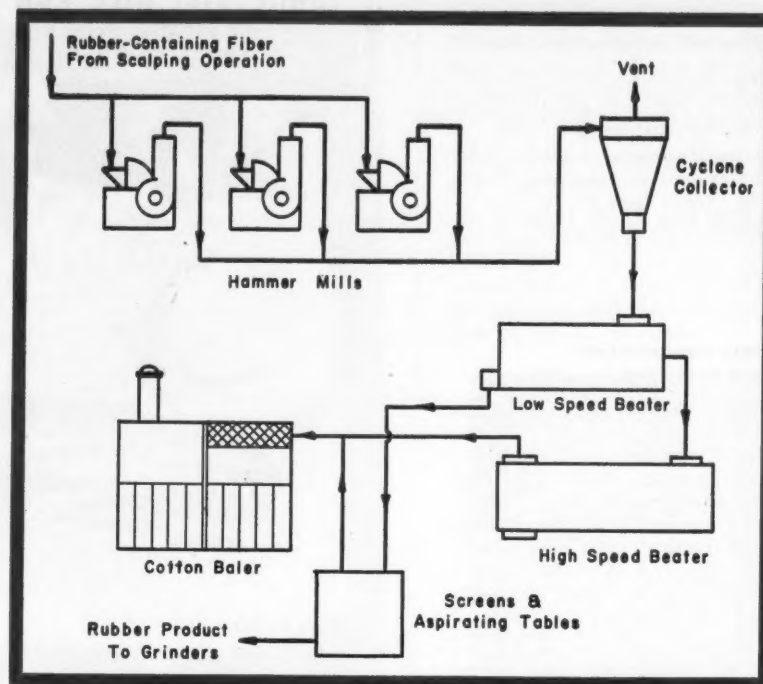


TENNESSEE **TC** CORPORATION

617-29 Grant Building, Atlanta, Georgia

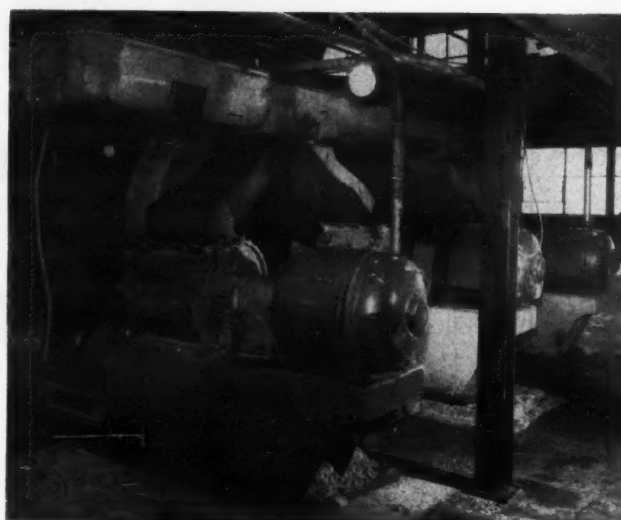
When inquiring check CP 7479 on handy form, pgs. 2-3

### new solutions of processing problems



Simplified flowsheet of secondary fiber separation at U. S. Rubber Reclaiming Company

## improved fiber separation process raises rubber recovery in mechanical reclaim



Three Dixie hammermills separate rubber from fiber

Special hammer mills "work over" tire cords so that rubber inside gets out—recovered fiber is cleaner, has wider application

**Problem:** Attrition mill did not do a good enough job of tearing rubber from fiber interior going to reclaiming process at U.S. Rubber Reclaiming Co., Inc., Buffalo, N.Y. As a result, the fiber ultimately leaving the process was dirty and thus limited in application—in roof coatings and as doll stuffing, for example. On top of that, company was losing as much as 20% of the rubber it should have been recovering from the used tires it employs as its raw material.

Primary aim is to get the rubber.

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Most of it, after going through Rubber Reclaiming's Patented Reclaimator process, is marketed as an easy-to-handle, easy-to-mix powdered rubber called Flo-Mix. This material, a recent development of the company, is being used in tires, battery boxes, mechanical goods, belting, and the like.

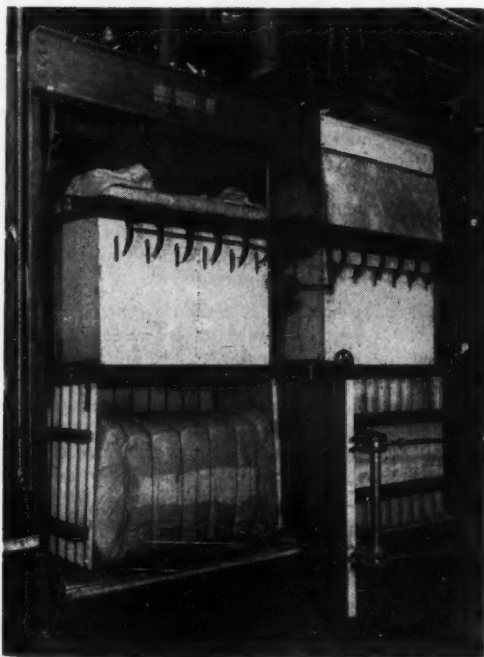
Tires are first put through cracker rolls which break them into  $\frac{1}{2}$ " pieces. Bead wire is removed, and rubber-fiber pieces pass through a primary system of grinding and scalping (here an attrition mill works satisfactorily). Material high in rubber goes on to a secondary screening system.

Material high in fiber leaves the primary system, by another route, and it is this material that gave trouble when an attrition mill was used to break down the fibers further so the rubber could be recovered from them.

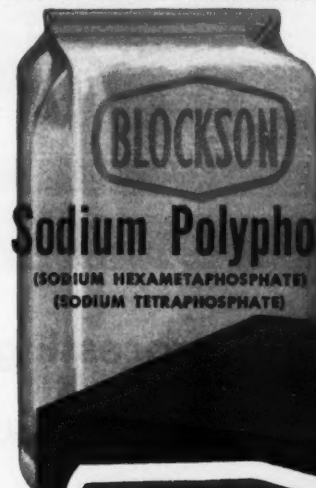
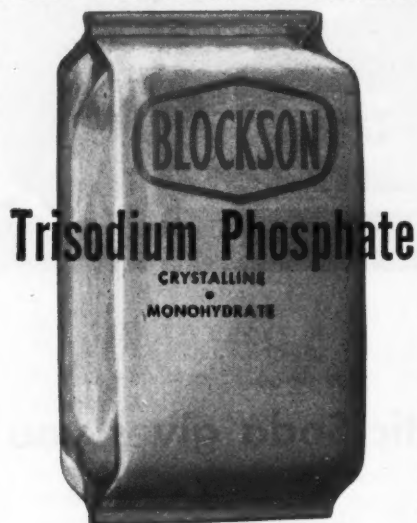
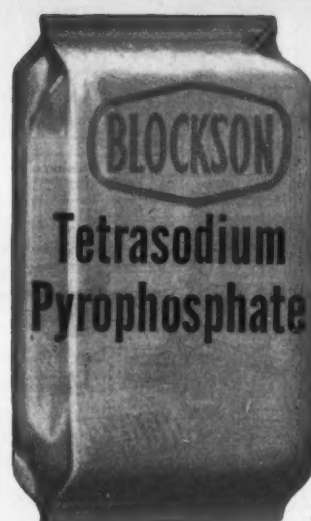
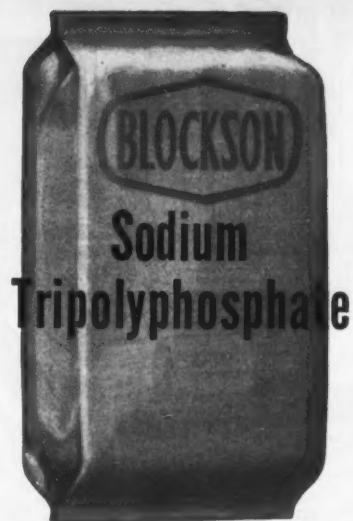
**Solution:** Three Dixie Hammermills were put into the process in place of attrition mill.

The mills have special corrugated plates which match similar corrugations of the unique hammer. This combination, plus the 3600-rpm speed of machine gives a ripping, tearing, shattering, and shredding which removes the rubber from the fiber. Mills have 150-hp motors. Separate 40-hp motors drive fans that provide a high suction on the mill during grinding and carry the product from the mill.

**Results:** Now, only 5% of the reclaimable rubber is lost. Since much less rubber is left in the fiber, that material is cleaner and lighter in color. (Dixie Hammermills are products of Dixie Machinery Mfg. Co., Dept. CP, 4200 Goodfellow Blvd., St. Louis, Mo. . . or check CP 7480, pages 2 and 3.)



Recovered fiber is baled in standard cotton baler



Sodium Polyphos is Blockson's brand name for a water soluble Glassy Sodium Phosphate with the desirable characteristics of Sodium Hexametaphosphate and Sodium Tetraphosphate.

ALSO MAJOR PRODUCERS OF:

SODIUM ACID PYROPHOSPHATE

CHLORINATED TRISODIUM PHOSPHATE

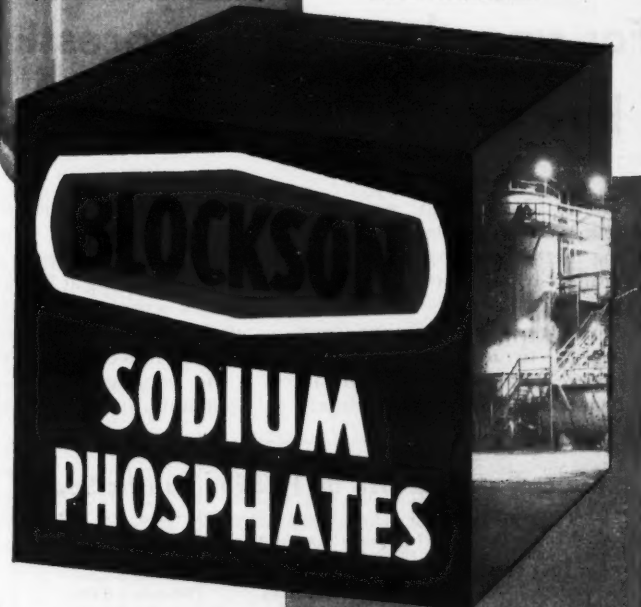
DISODIUM PHOSPHATE  
ANHYDROUS • CRYSTALLINE

MONOSODIUM PHOSPHATE  
ANHYDROUS • MONOHYDRATE

SODIUM FLUORIDE

SODIUM SILICOFLUORIDE

HYGRADE FERTILIZER



BLOCKSON CHEMICAL COMPANY  
Joliet, Illinois

When inquiring check CP 7481 on handy form, pgs. 2-3





## For smoother, better processing— buy the Uniformity Hooker Caustic Soda gives you

Month after month, year after year—you can standardize processing methods, and get consistent results, when you use Hooker Caustic Soda.

You need never adjust your process to meet variations in caustic soda shipments. You can be sure each new shipment closely

matches your current inventory.

Uniformity, from shipment to shipment, is the result of close quality checking at Hooker. More than a score of inspections and analyses safeguard the uniformity of the Hooker caustic you buy.

Do you agree, with leading companies in 30 different indus-

tries, that this is a good reason to standardize on Hooker caustic soda?

If you do, a letter or a phone call to the nearest Hooker plant or office will quickly bring you the product data and other facts you need to make your decision.

### You can standardize on Hooker Caustic Soda

Forms: Liquid 50% and 73% • Flake • Solid • Special fine flakes

Containers: Tank cars • Tank wagons • Barges • Drums

For fast service, phone: CHICAGO ..... Central 6-1311  
LOS ANGELES ..... NEvada 6-3826  
NEW YORK ..... MUrray Hill 2-2500  
NIAGARA FALLS ..... 6655  
TACOMA ..... Broadway 1215



*From the Salt of the Earth*

**HOOKER ELECTROCHEMICAL COMPANY**

When inquiring check CP 7482 on handy form, pgs. 2-3

**HOOKER ELECTROCHEMICAL COMPANY**  
15 Forty-Seventh St., Niagara Falls, N. Y.

Please send ☐ data sheets on Hooker Caustic Soda; ☐ Bulletin 100 describing Hooker products and services.

Name..... Title.....  
Company.....  
Address.....  
City..... Zone..... State.....

### NEW SOLUTIONS of processing problems

#### Screened woolen mill waste water approved for discharge into city sewage system . . .

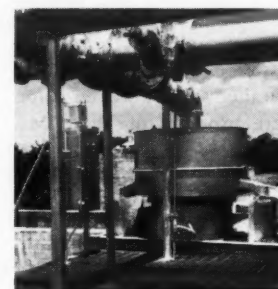
two circular vibrating screens provide capacity and separation efficiency needed for job

**Problem:** Lebanon Woolen Mills had to meet the requirements of Lebanon, Tenn., city officials by removing solids from waste water going to the city's new sewage system. Waste water contained 5% solids, including linters, detergent chemicals, and "eyebrows" (short hairs from legs and shanks of sheep).

A standard rectangular vibrating screen did not provide the desired combination of high throughput and screening efficiency. Because of the low capacity, waste material would pile up and slosh over the end of the screen. When a larger mesh screen was tried in attempts to improve capacity, too much of the solids passed through.

**Solution:** Two single-deck Sweco Separators, each 48" diam, have replaced the rectangular screen. Installation was designed from results obtained by on-the-spot testing for appropriate cloth openings (80-mesh stainless steel, 0.0070"

opening). The two units operate 24 hr per day, screening a total of 800 gpm (400 gpm each). One unit can handle the total load if the other must be shut down.



One of the Separators at Lebanon Mills

Separator's main assembly consists of a circular bottom frame upon which is clamped the screen cloth and top frame. Spouts are provided for continuous discharge

of undersize and oversize material. Motor is mounted vertically beneath center of screen and is rigidly attached to main screen assembly. An eccentric weight is fastened to motor shaft above motor, and an adjustable eccentric weight is fastened below motor. Gyration of screen is brought about by rotation of these weights.

Material to be screened is fed into center of screen and tends to spiral outward toward edges of screen. Here, it moves in a clockwise direction to oversize discharge spout. Big feature of the Separator is the ease with which screening action can be varied to suit a particular material. This can be accomplished by adjusting position of lower weight or changing its mass.

Since entire screen assembly, including the motor, is a rigid structure floating on springs, internal deflecting forces generated by the two weights act through center of the system. Thus, screen is self-balancing, which means that there is a minimum of mechanical stress in the structure and that minimum power is needed to produce gyration.

**Results:** Separators screen waste at the required

rate, and satisfy allowed the other extreme because for the

(Separate Southw 4800 Sa CP 748

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rate, and remove the amount of solids necessary to satisfy city officials. Actually the eyebrows are allowed to pass through the screen because all of the other solids are removed. These eyebrows are extremely hard to screen with any kind of device because of their tapered shape, which makes it easy for them to stick in screen openings.

(Separator is a development of Separator Division, Southwestern Engineering Company, Dept. CP, 4800 Santa Fe Ave., Los Angeles 58, Calif. . . . check CP 7483 on handy form, pages 2 and 3.)

**Tablet drying time is cut  
from six to four hours  
using infrared . . .**

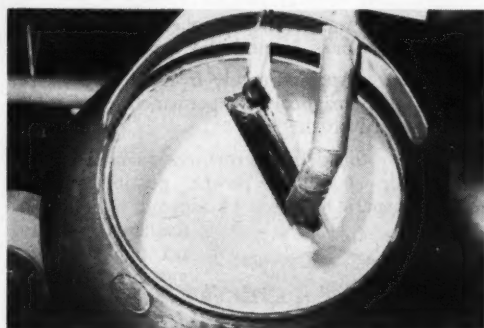
no chance of coating powder leaving drum

**Problem:** Pitman-Moore Co., Indianapolis, Ind., wanted to speed up drying of tablet coatings. Besides being slow, method being used — blowing hot air into drying pan — did not provide the uniformly moisture-free product desired.

**Solution:** An experiment was launched to try infrared radiant heat. One infrared heater — 800 w Chromalox Electric Radiant Heater — was installed in each drying pan.

Capacity of individual coating pans is 150 pounds of tablets, and the temperature of the drying air is between 130° and 180°F. The infrared heating method is used on any tablet coating where heat is not a detrimental factor.

**Results:** Drying time is now four hours as compared to six hours with the previous method. Moisture content has been decreased to one to two per cent after drying instead of two to three



Infrared radiant heater inside of tablet drying pan.  
Drying time has improved 33%

per cent with hot air technique. Coating is dried more uniformly, and since no air disturbance is created by infrared system, inert coating powder does not settle on outer surfaces of equipment.

(Information and permission to take photo was given by Pitman-Moore Co., PO. Box 1656, Indianapolis 6, Ind. Chromalox Electric Radiant Heater is product of Edwin L. Wiegand Co., Dept. CP, 7500 Thomas Blvd., Pittsburgh 8, Pa. . . . check CP 7484 on handy form, pages 2 and 3.)

# POLYVINYL ACETATE EMULSION

for paint

**permanence  
water resistance  
simple formulation**

**RESYN 12K-51** is an integrally plasticized polyvinyl acetate emulsion, tailor-made for paints. It offers you these advantages:

**PERMANENCE** due to polymerizing a plasticizing comonomer with vinyl acetate—instead of adding liquid plasticizer to straight polyvinyl acetate. No evaporation or migration can embrittle film on aging.

**WATER RESISTANCE** in paints for interior as well as exterior formulations. Films of RESYN 12K-51 on glass withstand 500 wet rubs, compared to 15-50 wet rubs for ordinary polyvinyl acetate emulsion under the same conditions.

**SIMPLICITY** of formulation—Paint can be made easily with RESYN 12K-51 in regular paint equipment, with high hourly outputs. Yet the formulator has considerable latitude for alterations to suit his own requirements. Formulas and technical help may be obtained by writing to Resin Division, National Starch Products Inc., 270 Madison Ave., New York 16, N. Y.

## DATA

Solids — 55%

pH — 4.5

Particle Size — Mostly under  
1 micron

Viscosity — 2000-2500 cps.

Water Resistance — Excellent

Films — Clear, flexible, tough,  
water-resistant



RESYNS® • ADHESIVES • STARCHES

When inquiring check CP 7485 on handy form, pgs. 2-3

Resin Division Dept. 3  
National Starch Products Inc.  
270 Madison Avenue, New York 16, N. Y.  
Please send me a quart of RESYN 12K-51, and  
practical information on its use.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



# 3000 impulses help keep mid-west refinery "on stream"



**T**HIS big refinery at Lawrenceville, Ill.—like a lot of other important refineries — uses Yarway Impulse Steam Traps.

Over 3000 Yarway Impulse Traps are installed on tracer lines and for draining steam headers.

Popular features of the Yarway Impulse Steam Trap are its ability to get equipment *hot in a hurry*—and keep it hot! . . . also its small, handy size—fits in easily in any location; its stainless steel body and working parts; quick installation; easy maintenance; low initial cost.

Another advantage—**IMMEDIATE DELIVERY** from 250 local distributors, plus quick service from nearby Yarway field engineers.

More than 900,000 Yarway Impulse Steam Traps have been sold. For a free Steam Trap Selector, write . . .

**YARNALL-WARING COMPANY**  
125 Mermaid Ave., Philadelphia 18, Pa.

## YARWAY<sup>®</sup> impulse<sup>®</sup> steam trap



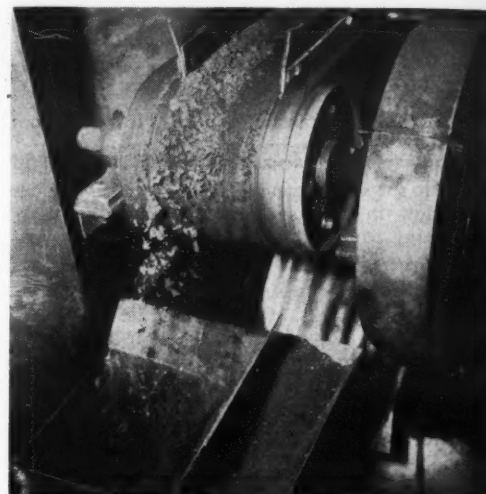
When inquiring check CP 7486 on handy form, pgs. 2-3

## NEW SOLUTIONS of processing problems

### **Safety Improved at Wilson & Co. with use of permanent magnets at animal feed mill . . .**

eliminate possibility of dust explosion while grinding high protein supplements

**Problem:** At Wilson & Co. in Chicago, a large Stedman mill is used for grinding high protein supplements in the preparation of R. W. brand animal and poultry feed. Magnetic separators are used at the mill to insure product purity and prevent damage to equipment. Formerly electro-



Permanent pulley magnet in use at Wilson & Co. is similar to one shown here in operation

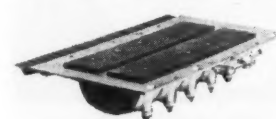
magnets were used at the mill. Since dust explosions have been known to occur in this milling operation, it was necessary to eliminate any possibility of a spark around the equipment.

**Solution:** Approximately five years ago, a permanent pulley magnet and a permanent plate magnet were installed on the mill.

**Results:** Since the permanent magnets require no outside source of power, possibility of an electrical spark has been eliminated. In addition,

maintenance of product purity and prevention of damage to equipment is assured to a higher degree since any doubt about the magnets being in operation all of the time has been removed. Also, operation is more economical since no rectifiers are needed to furnish DC current for the magnets.

(Permanent magnets in use on mill are product of Dings Magnetic Separator Co., Dept. CP, 4740 W. Electric Ave., Milwaukee 46, Wis. . . or for more information check CP 7487 on handy form, pages 2 and 3.)



Example of type of permanent plate magnet used on animal feed mill



Remember the trade marks "tt"  
and "TUBE-TURN" are applicable only  
to products of TUBE TURNS.



**Engineered  
for endurance**

**T**HE TUBE-TURN Welding Neck Flange is the preferred choice for most severe piping services—resulting from high pressures, temperature extremes, or numerous fluctuations of substantial amount in either temperature or pressure or both. Due to its long-tapered hub which affords a smooth transition in thickness, the welding neck flange assembly has an endurance strength equal to that of pipe joined by butt welds.

You can fill all your requirements for Welding Fittings and Flanges from TUBE TURNS' complete line. For prompt, efficient service, call your nearby TUBE TURNS' Distributor. You'll find one in every principal city.

The Leading Manufacturer of Welded Fittings and Flanges

**TUBE TURNS**

LOUISVILLE 1,  
KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Chicago • Denver • Los Angeles  
San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas



ENGINEERING SERVICE

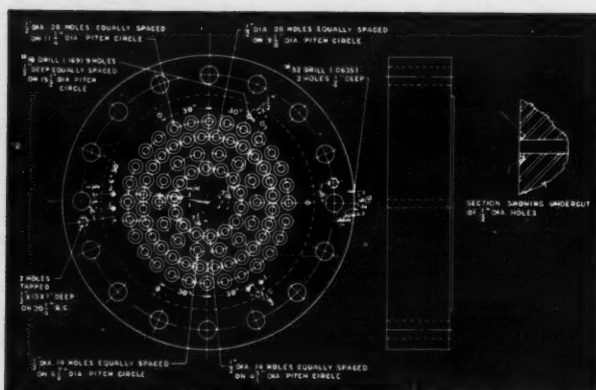


**YOUR NEEDS** in welding fittings and flanges are met efficiently and quickly by your nearby TUBE TURNS' Distributor. There are more than 4000 items in the complete line of TUBE TURNS' products. Example: carbon steel elbows from 1/2" to 42" diameter as shown.



**SIMPLIFIES JOB.** The uniform wall thickness and true circularity of TUBE-TURN Welding Elbows makes possible accurate fit-up when cut to odd angles for jobs such as the 16" gas line shown.

## Your problems solved by TUBE TURNS' ENGINEERING SERVICE



*Design of special flange for holding heating elements.*



**TUBE TURNS, Dept. KK-2**  
224 East Broadway, Louisville 1, Kentucky

Company name \_\_\_\_\_  
Company address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Your Name \_\_\_\_\_  
Position \_\_\_\_\_

**M**OST FLANGE NEEDS in industrial piping are filled by TUBE TURNS' ASA line of various types, sizes and materials. However, there are many exceptions . . . "specials" such as these: (1) lens ring flanges for use at 5300 psig and 400°F, with test pressure of 10,600 psig; (2) flanges in sizes from 14" through 72" for use at 30 psig and 400°F max.; (3) 2" flanges for high vacuum service at 400°F—950°F, and (4) various complex sheet tube flanges.

A "special" example is shown at the left, developed by TUBE TURNS' Engineering Service Division for E. L. Wiegand Co., Pittsburgh. It has 84 holes for heating elements. Flanges must withstand hydrogen-nitrogen mixture at 1000 psig at 750°F and 3000 psig at atmospheric temperature.

**TUBE TURNS IS AT YOUR SERVICE!**

### DISTRICT OFFICES

New York	Midland
Philadelphia	Tulsa
Pittsburgh	San Francisco
Cleveland	Los Angeles
Chicago	Seattle
Houston	Atlanta
Dallas	Denver



"T" and "TUBE-TURN"  
Reg. U. S. Pat. Off.

**TUBE TURNS**  
LOUISVILLE 1, KENTUCKY  
A DIVISION OF NATIONAL CYLINDER GAS COMPANY

Increases  
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**Increase shelf life  
of cosmetics with  
silicone fluids**

Recent laboratory tests indicate that alcohol-soluble silicones may be successfully blended with common cosmetic products.

Their addition is said to result in increased water repellency, longer shelf life, and better protective action against detergents. Tests indicate that blending can be done without entailing any new manufacturing processes or equipment.

Potential applications include lipstick, hair dressings, cold creams, and hand creams.

(Summary of talk given in New York City before Toilet Goods Association, by T. H. Reilly and E. G. Tajkowski, Silicone Products Department, General Electric Company, Department CP, Pittsfield, Massachusetts.)

**Dehydrogenation process  
outlined in bulletin**

Basic principles of Houdry dehydrogenation process for producing butadiene from butane, together with ten-year operational results, are presented in eight-page bulletin. Containing various tables and a simplified flow diagram, booklet discusses process characteristics and factors, construction materials, and costs. A few commercial installations are briefly described.

"Houdry Pioneer," Vol. 6, No. 4, is available from Houdry Process Corporation, Dept. CP, 1528 Walnut Street, Philadelphia 2, Pa. When inquiring specify CP 7488 on the convenient Reader Service slip located between pages 2 and 3.

For more information on product at left, specify CP 7489 . . . see information request blank between pages 2 - 3.

For more information on product at right, specify CP 7490 . . . see information request blank between pages 2 - 3.

# Cyanamid's

No. 2 of a series of advertisements

## ACRYLO-NEWS

AERO\* Acrylonitrile, though a highly stable chemical, is the most reactive of the vinyl monomers. It is so versatile that it can be used either as an intermediate in the preparation of dyes, pharmaceuticals, insecticides and other useful products, or by direct application in the broad fields of rubber,

plastics and textiles. Its polymers and copolymers can be formulated to add many desirable properties to today's products and to create interesting new products. The following items and abstracts, gathered from many sources, indicate a few facets of current research with this versatile monomer.

☆☆☆☆☆☆

**SURFACE COATINGS** which yield crater-free films upon curing can be made by combining acrylonitrile with a polymerizably reactive alkyd resin, a catalyst, and a phenol-formaldehyde resin. The fine film properties are also applicable to laminating materials, molding compositions and other resinous products.

**SYNTHETIC ACRYLONITRILE RUBBERS** cured without sulfur result in exceptional aging properties. Hexamethylene tetramine used to vulcanize mono-olefins like acrylonitrile produces a resinous material, while copolymers containing higher ratios of diolefins form a rubber plastic.

**MIXED DIALKYLAMINES** from acrylonitrile find application as polymerization inhibitors, pharmaceutical intermediates and a variety of other uses. The reaction can be initiated by addition of a primary amine to acrylonitrile, alkylation, followed by thermal cleavage.

**HIGH TEMPERATURE DYEING OF SYNTHETIC FIBERS** decreases dyeing time considerably, permitting acrylic fibers to maintain tensile strength, color fastness and other characteristics equal to or better than results of normal dyeing.

**THERMOPLASTIC MOLDING COMPOSITIONS** can be formed by mixing a premilled acrylonitrile-butadiene copolymer with a thermoplastic resin such as a copolymer of acrylonitrile and styrene. The final products range in flexibility from those resembling soft leather to tough, hard, yet resilient molding compositions, according to the ratio of the constituents used.

(Some or all of the above items are covered by U. S. or foreign patents)

☆☆☆☆☆☆

Should you wish a more complete bibliography of current literature and new developments concerning acrylonitrile, we shall be glad to place your name on our mailing list.

As the pioneer producer of this exciting vinyl monomer, American Cyanamid has expanded its production facilities to assure users adequate supplies at low price. Write for technical assistance in your acrylonitrile research.

\*Trade-mark

AMERICAN *Cyanamid* COMPANY

PETROCHEMICALS DEPARTMENT  
30 Rockefeller Plaza, New York 20, N. Y.





Factory-cut, curved FOAMGLAS blocks for the sidewalls and smaller pieces for the knuckle radius of the heads (cut and fitted on the job as shown here) were easily installed by Columbia-Southern workmen.

0° to 5° F.

## FOAMGLAS tank insulation solves a costly maintenance problem for COLUMBIA-SOUTHERN

FOAMGLAS insulation on five chlorine weighing tanks has practically eliminated expensive insulation replacement and maintenance for Columbia-Southern Chemical Corporation. Chief Engineer G. L. Cobb of their Natrium, West Virginia, plant explains:

"Previous tank insulations absorbed too much moisture. Since the equipment operated at 0° to 5° F., the moisture formed ice behind the insulation separating it from the tank walls. As a result, the old insulation constantly fell off, and frequent replacement was necessary.

"FOAMGLAS solved this problem because it *stays dry* . . . its sealed glass

cells *can not* absorb moisture. Since we installed FOAMGLAS more than six years ago, maintenance and replacement have not been a problem. Furthermore, its moisture-proof property has assured us constant insulating efficiency."

Solve *your* insulating problems with FOAMGLAS, the unique cellular glass insulation. It is moisture-proof, acid-proof, fireproof and has a strong, rigid structure.

Send for our new booklets describing its use for tanks and other equipment; piping; or walls, floors, roofs and ceiling. Write, indicating your specific interest, to Department CP-44 . . .

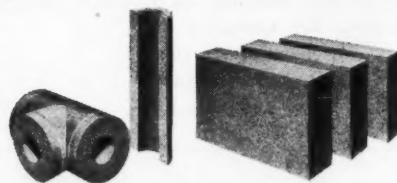


G. L. Cobb, Chief Engineer  
Columbia-Southern Chemical Corp.

PITTSBURGH CORNING CORPORATION • One Gateway Center • Pittsburgh 22, Pa.

# FOAMGLAS®

the cellular, stay-dry insulation



Pittsburgh Corning  
also makes  
PC Glass Blocks

### NEW SOLUTIONS

#### Wire-inserted rubber hose resists acid fumes in copper refinery . . .

provides flexible vent connection

**Problem:** Life of flexible metal hoses was short when used for venting sulfuric acid fumes formed in electrolytic refining of copper at a large eastern smelter. Connections between hoods and removal ducts had to be flexible since hoods were sometimes moved between cells during operation.

At first, a flexible 316 stainless steel articulated hose was used. This proved satisfactory. But when nickel alloys became short in supply, other types of stainless were substituted, lasted only half as long.

**Solution:** Lightweight, flexible wire-inserted hose made of spiral-



Flexible hoses connect tank hoods to fume removal ducts

ly-wound Neoprene-impregnated cotton duck was tried. Hose was 5" diam Spiratube R. Neoprene coating was 0.080".

**Results:** Hose was found to withstand acid fumes and abrasion. Small wall breaks were repaired by operating personnel with a patching kit. In service during past few months, indications are that this rubber tubing will stand up as well as the 316 stainless flexible metal hose.

(Spiratube R is a product of Flexible Tubing Corp., Dept. CP, Guilford, Conn. . . . check CP 7491, pages 2 and 3.)

For more information on product at left, specify CP 7492 . . . see information request blank between pages 2 - 3.

Depend  
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**Problem:**  
Chicago,  
30-40 psi  
process  
variable  
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**Solution:**  
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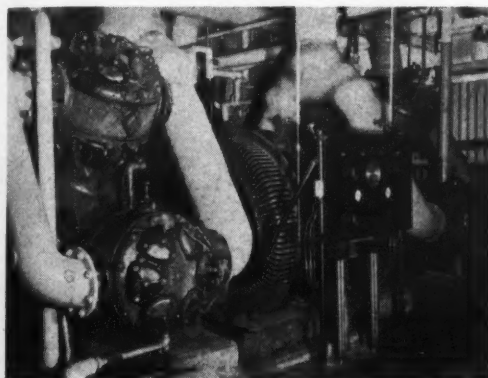
APRIL, 1

**Dependable supply of compressed air for fermentation process furnished by heavy duty units . . .**

Abbott Laboratories uses four compressors in manufacture of antibiotics

**Problem:** At Abbott Laboratories in North Chicago, Ill., a source of compressed air in the 30-40 psi range was required for the fermentation process in the manufacture of antibiotics. A variable supply of air was needed that would be available continuously without interruption.

**Solution:** In 1945 a 600 hp WN-114 twin compressor was acquired. Subsequently, similar units of 600, 500, and 600 hp were obtained in 1947, 1950, and 1951, respectively, as production de-



Compressors at Abbott Labs are compact and attractive in appearance

mands increased. As shown in accompanying photograph, twin unit consists of two compressors powered by a single motor. Where required, one of the compressors can be operated without the other by disconnecting one from motor.

Compressor is equipped with two separate force-feed lubrication systems, one for running gear and the other for cylinders. Running gear lubrication system is fully protected against possibility of pressure failure by means of automatic relays. Compactness of compressor is illustrated in photograph. The 500 hp unit is shown delivering 4344 cfm of air. Compressor is package-type, and it can be ready to operate within twenty-four hours after it is delivered.

**Results:** Four compressors presently being used at Abbott have given satisfactory service. They furnish a dependable source of air 24 hours a day for the fermentation process. Only a minimum of maintenance has been necessary, with all units being inspected regularly. Another advantage of this equipment is favorable appearance.

(WN-114 compressors are product of Joy Manufacturing Company, Department CP, Oliver Building, Pittsburgh 22, Pennsylvania . . . or for more information concerning manufacturer's product, reader may simply check CP 7493 on the convenient Reader Service slip which is located between pages two and three.)

# YOU CAN PUMP IN CONTROLLED VOLUME

## HYDROCHLORIC ACID . . . ALL CONCENTRATIONS

## CHLORINATED HYDROCARBONS

## CORROSIVE METALLIC SALT SOLUTIONS

## DILUTE ACIDS

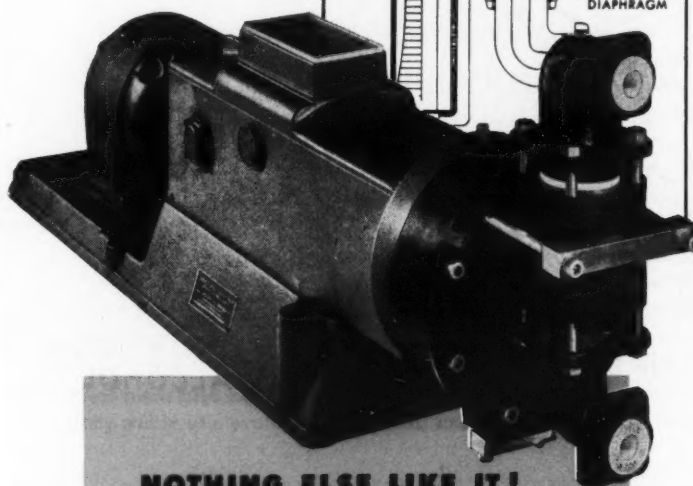
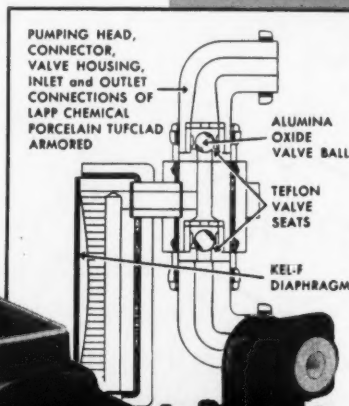
## MIXED ACIDS

## WITH

# Lapp

# PULSAFEEDER

COMPLETELY NON-METALLIC CONSTRUCTION



### NOTHING ELSE LIKE IT!

Lapp Pulsafeeder is the combination piston-diaphragm pump for controlled-volume pumping of fluids. Reciprocating piston action provides positive displacement. But the piston pumps only an hydraulic medium, working against a diaphragm. A floating, balanced partition, the diaphragm isolates chemical being pumped from working pump parts—eliminates need for stuffing box or running seal. Pumping speed is constant; variable flow results from variation in piston-stroke length—controlled by manual hand-wheel, or, in Auto-Pneumatic models, by instrument air pressure responding to any instrument-measurable processing variable.

Solid Lapp Chemical Porcelain, combined with parts of alumina ceramic, teflon and Kel-F plastics, is used for the liquid end of this model of Lapp Pulsafeeder. All parts which can come in contact with liquid being pumped are non-metallic, chemically inert. Thus, positive-displacement metered pumping of "hard-to-handle" corrosive chemicals is made certain and permanently trouble-free.

### WRITE FOR BULLETIN 300

with typical applications, flow charts, description and specifications of models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Division, 105 Wilson Street, Le Roy, New York.

When inquiring check CP 7494 on handy form, pgs. 2-3



# Variety of reactions offered by anhydride

Alone, the anhydride can be used to control vulcanization of rubber. In low concentration, it is a catalyst for acid-curing thermosetting resin formulations.

Especially promising are the monoesters, diesters, and polyesters. These are formed from reaction with monohydric or polyhydric alcohols. The reaction with monohydric alcohols to form monoesters and diesters is illustrated.

*Monoesters* are used as softening agents for natural and synthetic rubbers.

*Diesters* find application as stabilizers against thermal decomposition or discoloration in vinyl-

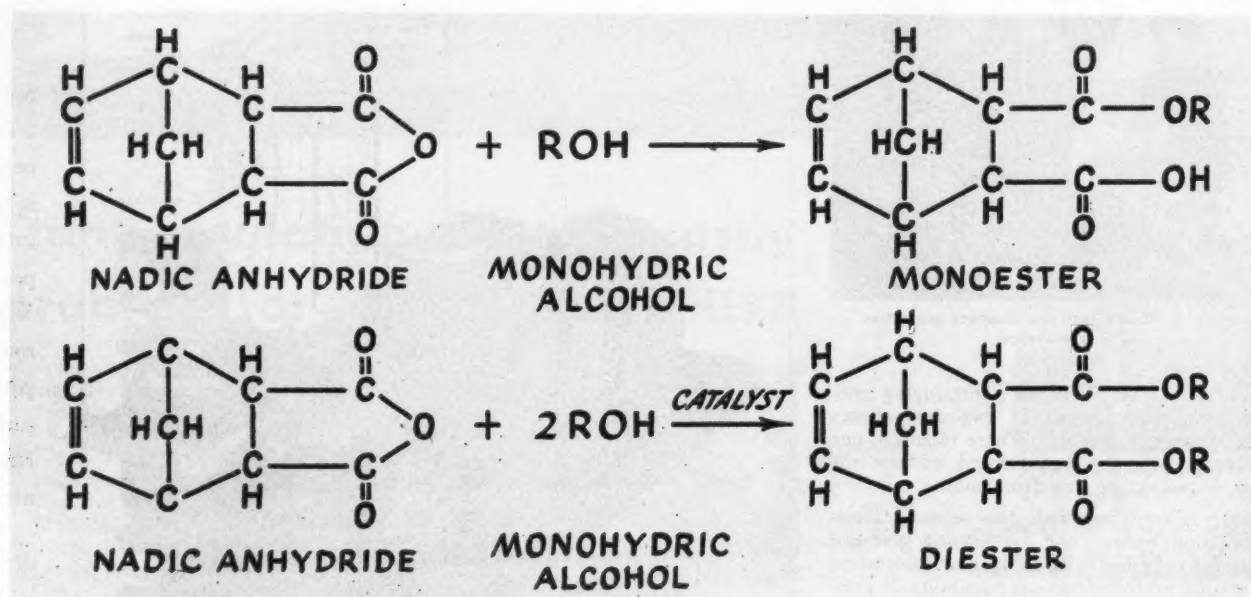
## materials

give wrinkle finishes. In the form of emulsions, they can be used in clear or pigmented films.

Many of these esters have been found of value as plasticizers in vinyl, amid-aldehyde, urea-formaldehyde, and melamine-formaldehyde resins.

*Esters from glycol and polyglycol monoethers* may be used as softeners or modifiers in waxes and polishes for leather. They can also be used as high-boiling solvents, lubricants, textile assistants, and penetrants.

**Description:** Called Nadic anhydride by manufacturer, compound's chemical name is endo-cis-bicyclo (2.2.1)-5-heptene-2, 3-dicarboxylic an-



Typical esterification of Nadic anhydride with monohydric alcohols. Mixed diesters may also be prepared

**Especially promising are the monoesters, diesters, and polyesters**

**Uses:** Anhydride can be used alone, and as an intermediate for esterification, hydrogenation, hydrolysis, oxidation, ammonolysis, bromination, and polymerization. Lactones are formed by treating with sulfuric acid solutions. Other reactions include sodium bisulfite addition, hydroxylation, addition of phenyl azide, and reaction with phosphorus pentachloride. Material reacts with soybean oil to form a product that can be used as a vehicle for emulsion paints.

dine chloride polymers and copolymers. The diesters copolymerize with polyvinyl chloride. The homopolymer of the diallyl ester is useful in bonding, electrical insulating, and impregnating and surface coating compositions. Dimethyl and diethyl esters are used in insect repellents. Sulfonated diesters are surface active agents.

*Polyester resins* are tough, strong, and water resistant. Copolymerization with maleic anhydride or styrene or both gives hard, tough, resinous products. Some of these, when incorporated into fibers, form hard, durable laminates.

When polymerized with free fatty acids, polyesters produce modified alkyd resins. These resins can be combined with fatty drying oils to make good coating and varnish compositions. In coating formulations containing no drying oil, polyesters

hydryde. Molecular weight is 164.2. Material comes in white crystalline form, and has a melting point of 164-165°C.

Soluble in benzene, toluene, acetone, carbon tetrachloride, chloroform, ethanol, and ethyl acetate, the anhydride is only partly soluble in petroleum ether. No specific hazards in handling or use have been uncovered to date. However, it is recommended that contact with skin or exposure to vapors be avoided. At present, anhydride is available in research quantities.

(Nadic anhydride is a development of National Aniline Division, Allied Chemical & Dye Corp., Dept. CP, 40 Rector Street, New York 6, New York . . . or for more information check CP 7495 on handy form, pages 2 and 3.)

Extreme vinyl gives

Uses:  
wax form  
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Features:  
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Emulsion  
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**Extremely fine particle size of  
vinyl polymer emulsion  
gives bright finish**

**Product is compatible with self-polishing floor waxes**

**Uses:** As a basic material in self-polishing floor wax formulations. Material can be used alone or with waxes.

**Features:** Extremely fine particle size, less than 0.03 micron, gives a finish that dries bright. Emulsion dispersion system is compatible with carnuba and microcrystalline waxes and shellac. No additional emulsifying agents are required in formulations in order to give proper leveling and washability characteristics. Emulsion can also be infinitely diluted with water.

Besides contributing to high gloss, laboratory tests indicate that emulsion improves water resistance, durability, and washability of self-polishing wax compositions.

Emulsion is unaffected by repeated freeze-thaw cycles. It possesses good chemical and mechanical stability, and can be stored for long periods of time without deterioration. Emulsion can be handled by pumping, using equipment suitable for low viscosity fluids.

**Description:** U-2001 Ubatol is a vinyl polymer emulsion possessing the physical properties given in accompanying table.

Emulsion is not quite a film-forming material itself. For best results it should be slightly plasticized. Manufacturer recommends 15% or less (based on polymer solids) of a suitable plasticizer such as Ohio Apex KP-140, dibutyl phthalate, or dibutoxyethyl phthalate. Plasticizer is added in morpholine oleate or similar soap dispersion.

Viscosity of the emulsion may be increased up to 50,000 cps by addition of thickening agents, such as Methocel or Acrysol, in concentrations of 2.5 to 5.0 parts per hundred of polymer solids.

(U-2001 Ubatol is a development of Union Bay State Chemical Co., Inc., Dept. CP, 491 Main St., Cambridge 42, Mass. . . or for more information check CP 7496 on handy form, pages 2 and 3.)

**Physical Properties of U-2001 Ubatol**

Particle size (microns)	<0.03
Total solids (%)	35-37
Sp gr (25°C)	1.03
Viscosity (cps @ 25°C)	15-25
Particle charge	Negative
pH	8.7-9.3

**CHECK THESE PHYSICAL PROPERTIES  
OF LUCITE<sup>®</sup> ACRYLIC RESINS**

		"LUCITE" 41	"LUCITE" 42	"LUCITE" 44	"LUCITE" 45	"LUCITE" 46
DENSITY, 25°C.		1.19	1.12	1.06	1.05	1.05
REFRACTIVE INDEX, 25°C.		1.493	1.484	1.480	1.477	1.4778
HARDNESS, ROCKWELL R (ASTM D 785-44T)		124	116	152	112	88
HEAT DISTORTION TEMPERATURE, 264 LB./SQ. IN. (ASTM D 648-45T)	°C.	72	55	< 25	54	30
TENSILE STRENGTH (ASTM D 638-44T)	lb./sq. in.	7800	5400	500	3600	2100
ELONGATION AT BREAK (ASTM D 638-44T)	%	1	25	300	1	175
IMPACT STRENGTH, CHARPY UNNOTCHED	Ft. lb./in.	4.1	4.1	3.4	0.8	1.4
DIELECTRIC STRENGTH (0.05 IN. FILM)	v./mil	740		625		
POWER FACTOR, 25° C., 60 CYCLES		0.065	0.045	0.068	0.012	
DIELECTRIC CONSTANT			2.9	2.9	2.5	

**Here is a group of versatile  
resins you should investigate**

These Du Pont "Lucite" acrylic resins are designed for use in solution applications and as modifiers for other resinous compositions. Soluble in a wide variety of polar and non-polar solvents and compatible with many plasticizers, this series of resins includes:

- "Lucite" 41 methyl methacrylate polymer
- "Lucite" 42 ethyl methacrylate polymer
- "Lucite" 44 n-butyl methacrylate polymer
- "Lucite" 45 isobutyl methacrylate polymer
- "Lucite" 46 copolymer of n-butyl and isobutyl methacrylates

These resins have excellent outdoor durability, are chemically stable at elevated temperatures, and are resist-

ant to water, aqueous salt solutions, and moderately concentrated acids and alkalis. Versatile in nature, they are used in lacquers and other finishes, in coatings for vinyl sheeting, and in adhesive compositions; in wax blends for use as a casting material, in aerosol preparations, and as modifiers for other resins.

Why not investigate the use of Du Pont acrylic resins in your business? We'll be glad to send you more information on these versatile materials—specifications, properties, suggested uses, etc. Just send in the coupon below, or write to: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Delaware.

**AVAILABILITY:** Du Pont "Lucite" acrylic resins—available as clear granular solids—are shipped in fiber drums.

\* REG. U.S. PAT. OFF.



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DEPARTMENT  
**CHEMICALS • PLASTICS**

E. I. du Pont de Nemours & Co. (Inc.)  
Polychemicals Department 584, Wilmington 98, Del.

Please send me more information on Du Pont "Lucite" acrylic resins—specifications, properties, suggested uses, etc. I am interested in evaluating acrylic resins for the following applications:

Name \_\_\_\_\_ Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 7497 on handy form, pgs. 2-3



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**Polypropylene glycol mono-octyl ether**—Suggested for use as a rewetting agent for paper products, as an antifoamer, and as an intermediate for etherifications and esterifications yielding solvents and surface-active agents. Viscosity (cs @ 100°F) is 23-27; sp gr, 0.955. Solubility is similar to ether listed above.

(Polyglycol E600 Methyl Ether, Polyglycol E600 x-Octyl Ether, Polyglycol P600 Methyl Ether, and Polyglycol P600 x-Octyl Ether are products of The Dow Chemical Co., Midland, Mich. . . . or for more information check 7500 on handy form, pages 2 and 3.)

#### Adds dichloroacetic acid, dichloroacetyl chloride to line

**Uses:** In the manufacture of pharmaceuticals, dyes, and other organic compounds.

**Features:** Dichloroacetic acid undergoes normal reactions of a strong organic acid, as well as substitutive reactions due to its two chlorine atoms.

Dichloroacetyl chloride can be used in place of the acid when additional reactivity of the carboxyl group is needed.

**Description:** Products are liquid at room temp. They are available in purities of 98% or better. Physical properties are given below:

	Cl <sub>2</sub> CHCOOH	Cl <sub>2</sub> CHCOCl
Boiling point (°C)	194.4	108
Melting point (°C)	10.5	—
Sp gr (room temp)	1.56	1.53

Both compounds are corrosive to the skin.

(Dichloroacetic acid and dichloroacetyl chloride are products of Kay-Fries Chemicals, Inc., Dept. CP, 180 Madison Ave., New York 16, N. Y. . . . or for more information check CP 7501 on handy form, pages 2 and 3.)

#### Aminohydroxy compounds discussed

Four-page bulletin gives physical properties of five aminohydroxy compounds and suggested uses as emulsifiers and for synthesis. Typical formulas are given for polishes, paste waxes, and cosmetic creams and lotions.

Specific compounds are:

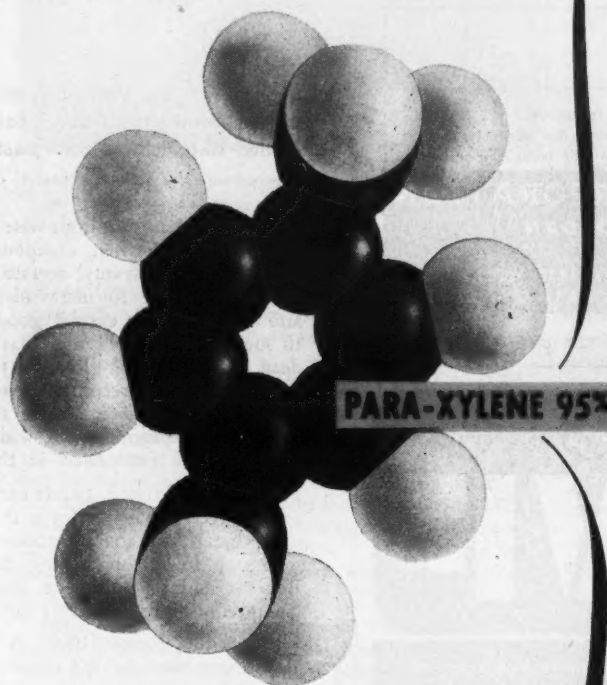
- 2-Amino-1-butanol,
- 2-Amino-2-ethyl-1,3-propanediol,
- 2-Amino-2-methyl-1-propanol,
- 2-Amino-2-methyl-1,3-propanediol, and
- Tris (hydroxymethyl) aminomethane.

Technical Data Sheet No. 18 is issued by Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 7502 on handy form, pages 2 and 3.

# Oronite PARA-XYLENE 95%

## has many potential uses in chemical synthesis

This important chemical may be oxidized to terephthalic acid, a new dibasic acid useful as a chemical intermediate and in the production of polyesters, polyamides, and other high polymers. Inquiries welcomed.



**ORONITE CHEMICAL COMPANY**  
38 Sansome Street, San Francisco 4, California  
30 Rockefeller Plaza, New York 20, New York  
600 South Michigan Avenue, Chicago 5, Illinois  
Standard Oil Building, Los Angeles 15, California  
Mercantile Securities Building, Dallas 1, Texas

### Chemical Synthesis Possibilities

Process	Product	Usage
Oxidation.	Terephthalic acid.	Formation of polyesters, polyamides, etc.
Oxidation.	Para-toluic acid.	Synthesis of dyes.
Oxidation.	Para-tolualdehyde.	Condensation with polyvinyl alcohol for adhesive resin.
Oxidation.	2, 5-Dimethylhydroquinone.	Stabilizing agent.
Oxidation.	Terephthalaldehyde.	Resins by condensation with diamines or sodium acetate.
Oxidation and chlorination.	Tetrachloroterephthalic acid.	Flameproof textiles.
Oxidation and chlorination.	Tetrachloropara-toluic acid.	Alkyd resin modifier.
Chlorination.	Tetrachloropara-xylene.	Dielectric, heat transfer medium.
Chlorination and hydrolysis.	Para-xylyl alcohol.	For xylyl phosphate. Waterproofing agent. Cellulose ethers.
Chlorination hot or in ultra violet light.	Para-xylyl chloride.	Lachrymatory.
Dichlorination at boiling or in ultra violet light.	Para-xylylene chloride.	Synthesis.
Chlorination and hydrolysis.	Para-xylylene glycol.	Modification urea-formaldehyde resins.
Chlorination in dark with iodine or iron as catalyst.	2-Chloropara-xylene and 2, 5-Dichloropara-xylene.	Solvent and/or intermediate.
Chlorosulfonation and reaction with ammonia.	Para-xylylene 2-sulfonamide.	Aldehyde resins. Cellulose acetate solvent.
Nitration.	2-Nitropara-xylene.	Solvent.
Nitration and reduction.	Para-xylylene.	Dyestuffs.
Dinitration.	2, 6-Dinitropara-xylene.	Dye synthesis.
Sulfonation.	Para-xylylene 2-sulfonic acid.	Intermediate.
Sulfonation.	Para-xylylene 2, 5-disulfonic acid.	Dyestuffs.
Sulfonation and caustic fusion.	Para-xylenol (2, 5-xylenol).	Making dimethyladipic acid, antiseptics.
Acetylation in presence AlCl <sub>3</sub> .	2-Para-xylylmethyl ketone.	Perfume bases. Pharmaceuticals.
Ethylation and dehydrogenation.	Vinyl para-xylene.	Molding compounds. Synthetic rubbers.

When inquiring check CP 7503 on handy form, pgs. 2-3



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When inquiring check CP 7504 on handy form, pgs. 2-3

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announces  
new line of  
natural iron  
oxide pigments

very very fine  
**WVF**

VVF pigments are produced by our unique grinding process to give a very, very, fine product controlled for top particle size and particle size distribution. VVF pigments will reduce your grinding and dispersing time in paints and allied products as much as 75%. VVF pigments give you brighter mass color, stronger tint, increased hiding power, and

higher gloss than standard grind pigments. VVF pigments now available are—Raw and Burnt Siennas, Raw and Burnt Umbers, Metallic Browns, Red Iron Oxide, and Primer Pigments.

Your Williams representatives will gladly give you complete information on this new pigment group—or mail coupon for illustrated VVF TECH REPORT.

**MAIL COUPON TODAY**

**C. K. WILLIAMS & CO., Easton, Pa., Dept. 28**

Please send me VVF TECH REPORT giving physical and chemical specifications and list of suggested applications.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

**WILLIAMS**  
COLORS & PIGMENTS

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**C. K. Williams & Co.**  
Easton, Pa.  
East St. Louis, Ill.  
Emeryville, Cal.

When inquiring check CP 7505 on handy form, pgs. 2-3

**materials**

When used in latex paints

**polyvinyl  
acetate  
emulsions**

impart sunlight resistance

Sheen can be varied from dead  
flat to semi-gloss; color range in-  
cludes deep tones and pastels

Emulsion paints gain high water resistance and toughness when compounded with either of two polyvinyl acetate emulsions. Films are stable to ultraviolet radiation and therefore also exhibit good resistance to sunlight. Sheen can be varied from a dead flat to a semi-gloss by proper formulation. This is accomplished by varying ratio of pigment to binder and by the selection of extenders. A wide range of colors can be formulated in these paints.

Properly formulated, paints can withstand several freeze-thaw cycles without noticeable change. Elaborate controls are not necessary in manufacturing the coating. Regular paint equipment can be used. Compounding is relatively simple.

First product, Resyn 10K25, is a polyvinyl acetate emulsion, having small particle size and high molecular weight. Solids content is 55%. Addition of water rapidly reduces viscosity of the emulsion. If water is taken away, emulsion breaks quickly. As supplied, emulsion viscosity is about 2500 cps. Weight per gallon is 9.2 pounds; pH is 4 to 5. Particle size averages under one micron.

Dry film hardness is approximately 50. This measurement is made with the Sward Hardness Rocker on 1.5 mil (wet) force dried films, cast on plate glass.

Second product, Resyn 12K51, is an internally plasticized polyvinyl acetate emulsion. A plasticizing comonomer has been polymerized with the PVA emulsion. This gives properties of permanent flexibility and toughness to the paint film. No evaporation or migration can embrittle film on aging. Film hardness (measured with the Sward rocker as above) is 22.

Other properties are approximately the same as those listed for Resyn 10K25.

Paints can be applied by brush, roller, or spray. When wet, equipment can be cleaned with soap or detergent and water. Products do not clog spray nozzles. Spraying is quick and uniform.

These paints dry to touch in ten minutes. Second coat can be put on in one to two hours. Odor is slight and pleasant, dissipates rapidly on drying.

Used inside or out, emulsion paints have superior adhesion to brick, concrete, "hot" plaster, and dry-wall construction. They can be used as primer-sealers on plaster and dry-wall. Paints also seal asphaltic surfaces, preventing bleed-through.

(PVA emulsions are products of Resin Division, National Starch Products Inc., Dept. CP, 270 Madison Ave., New York 16, N. Y. . . . or for more information check CP 7506, pages 2 and 3.)

**Typical Exterior Formulation**

	Pounds
Titanox RA-50	272
Sierra Mistron Talc HGO-75	79
Mineralite 3X Mica (325 mesh)	11
Monoammonium Phosphate	7
Triton X-100	1
Resyn 12K51*	372
Diethylene Glycol	11
Cellosolve	23
Water	65
2% solution CMC (No. 120 High Visc.)	250
	1091

\*Needs no plasticizer. If formulator desires greater flexibility, dibutyl phthalate can be added.

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## Insulation, laminates, liners are among applications of polyester film

**Combines mechanical, dielectric strength  
with heat and chemical resistance**

Polyester film resembles cellophane in appearance, but has unusually good mechanical and dielectric strength, long term resistance to heat, and chemical inertness (see **CHEMICAL PROCESSING**, February, 1952, p 38). Production of film, called Mylar, is scheduled to begin later this year. Applications given by manufacturer follow.

**Electrical insulation.** Film is used as phase insulation and slot liners for electric motors, and for insulation in capacitors.

**Industrial and electrical tapes.** Film makes a tough, dimensionally-stable base. Containing no plasticizer, tape will not dry out and become brittle with age.

**Metallic laminates.** When laminated to metals, material serves as protection during drawing, eliminating need for lacquering or tin plating. If laminated to both sides of metal foil and slit into narrow widths, a strong metallic yarn is produced. This yarn is unaffected by dry-cleaning solvents and high ironing temp.

**Metalized surfacing.** A thin layer of aluminum can be deposited on film by a vacuum process to give a mirror-like finish. When laminated to a fabric backing, this can be embossed to form decorative materials.

**Thermal insulation.** Laminated to a primary insulation material, film prevents internal condensation of water.

**Glazing.** Use in light weight storm windows is being tested.

**Drum liners.** Material can be used to line drums for shipment of corrosive chemicals.

Manufacturer states that packaging applications are not in the foreseeable future. One reason is that there is no easy method of heat sealing the film.

(Mylar is a development of E. I. du Pont de Nemours & Company (Inc.), Dept. CP, Wilmington 98, Del. . . . check CP 7507 on handy form located between pages 2 and 3.)

### Stabilizer controls color of vinyl halides

Technical data report is available on liquid cadmium salt designed to improve color stability of vinyl chloride resins. Product is intended as a supplement to rapid acid absorbers.

"Staflex OY" is issued by Deecy Products Co., Dept. CP, 120 Potter St., Cambridge 42, Mass. When inquiring specify CP 7508, pages 2 and 3.

## CHEMICAL PROGRESS .. at GENERAL MILLS

### New Resin Blend Makes Superior Coating ★★★★★ Aliphats Aid Soapmaking ★★★★★ Amines Prevent Steampipe Corrosion



Printers are grateful for the handsome, durable paper coating they get with Polyamide-epoxy resin blends. Photo above shows a label-coating job in a St. Paul printing plant.

**Dirty, Greasy, Sticky** hands won't hurt products coated with a blend of certain Polyamide and epoxy resins. It's a fact. These resin blends are the most durable coating and adhesive mixtures to come from the chemical lab in a long, long time.

Say you want to coat printed paper—labels, catalogues, periodical covers, displays, or calendars. You use the Polyamide-epoxy mixture in about a 50-50 blend. Varying the ratio varies flexibility and hardness. Your coating will have excellent flexibility and barrier properties . . . and a superior gloss. It provides top resistance to water, grease, gasoline, and most solvents or common chemicals. It won't peel, crack, or tear loose . . . even with a 180° fold. And, it's thermosetting, so it won't melt off or get tacky.

Often, this resin blend is superior to even expensive acetate laminations . . . and much less costly. It is non-blocking, and has both internal plasticity and curing. Polyamide-epoxy combinations also improve the eye appeal of coated products by giving colors brilliance and depth of tone without distortion.

For more information, please mail the coupon below.

★★★★★

**For Making Soaps and Sanitary Chemicals,** General Mills offers a variety of Aliphats (fatty acids) designed to help you solve troublesome production problems. These fatty acids include all the common types—soy, corn, cotton, coconut, tall oil and tallow—each available in various grades. They run from inexpensive mixtures to individual acids of very high purity. You'll find they saponify quickly, uniformly, and almost completely.

The quality and uniformity of General Mills Aliphats are especially evident in products derived from coconut oil. Aliphath 4, a technically pure lauric acid, and Aliphath

5, technically pure myristic acid, are used widely as raw materials for highest quality toilet preparations.

Where mixed coconut acids are more suitable, Aliphats 21-A (stripped), and 21-B (whole distilled) are often recommended. For additional information, just mail the coupon below—stating your needs as closely as possible.

There is an ALIPHAT for your specific need.

★★★★★

**To Prevent Corrosion** in your steam and return condensate lines, why not use a new technique that often gives fabulous results. General Mills Alamines and Alamacs, (fatty amines and amine acetates) are used for internal pipe treatment to prevent corrosion by both oxygen and carbon dioxide—and at less than the cost of neutralizing amines.

These General Mills Alamines and Alamacs stop corrosion in the pipes by adsorbing on internal metal surfaces—making them non-wettable to the steam or condensate. The film is very tenacious, and does not build in thickness. Result: exact measurement of feeding rate is unnecessary for these easy-to-use amines.

General Mills' primary stearyl amines (Alamines 7-D and H-26-D) and the corresponding acetates (Alamacs 7-D and H-26-D) are filming amine products. Similar fatty amines, when converted to fatty quaternary ammonium compounds, have already demonstrated their effectiveness as corrosion inhibitors in the oil industry.

To get more information about General Mills Alamines and Alamacs, please mail the coupon below.

## General Mills

CHEMICAL DIVISION  
KANKAKEE, ILLINOIS

Please send me additional technical information for the products checked below:

☐ Polyamide Resins ☐ Fatty Amines  
☐ \_\_\_\_\_ type Fatty Acids

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

*progress thru research*

When inquiring check CP 7509 on handy form, pgs. 2-3



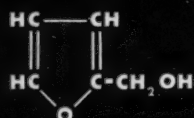
# FURFURYL ALCOHOL

## QO FURFURYL ALCOHOL

### VERSATILE TANK-CAR CHEMICAL

### CHEMICAL AND PHYSICAL PROPERTIES

QO furfuryl alcohol  
is an amber, mobile  
liquid, represented  
by the formula



#### Physical Constants of Pure Furfuryl Alcohol Are:

Boiling point, °C. (760 mm.)	170
Density, 20/4°C.	1.1285
Melting point, metastable crystalline form, °C.	-29
Melting point, stable crystalline form, °C.	-14.63
Refractive index, n <sub>D</sub> 20/D	1.4868
Specific heat, liquid, at 0° C., cal./g. /°C.	0.472
Specific heat, liquid, at 25° C., cal./g. /°C.	0.502
Surface tension, dynes/cm.	ca 38
Viscosity at 25° C., centipoises	4.62

Write for a sample, and Bulletin 205 describing the chemical and physical properties as well as the uses of furfuryl alcohol.

The Quaker Oats Company

## CHEMICALS DEPT.

336U The Merchandise Mart, Chicago 54, Illinois  
Room 536U, 120 Wall St., New York 5, N. Y.  
Room 436U, P.O. Box 4376, Portland 8, Oregon  
In Europe: Quaker Oats-Graanproducten N. V.,  
Rotterdam, The Netherlands,  
Quaker Oats (France) S. A., 3, Rue Pillet-Will, Paris IX, France  
In Australia: Swift & Company, Pty., Ltd., Sidney  
In Japan: F. Kanematsu & Company Ltd., Tokyo

When inquiring check CP 7510 on handy form, pgs. 2-3

## MATERIALS

### Explains batch sulfonation of alkyl benzene

Procedures for obtaining a variety of surface active end products from sulfonation of alkyl benzene are contained in technical bulletin of 4 pages. Batch type manufacturing procedures are outlined for producing active sulfonates ranging from 40% to 88% active. Bulletin also outlines analytical procedures for the usual general property tests to determine color, water content, per cent of sodium sulfate and per cent of active content.

Bul P-148 is available from Phosphate Division, Dept. CP, Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 7511 on handy form, pages 2 and 3.

### Resin improves wet strength, folding endurance of papers . . .

can be used with any type of pulp stocks

**Uses:** May be used for any type of pulp, including bleached rag and ground wood stocks. Product is recommended for toweling stock since it strengthens without affecting absorbency.

**Features:** Resin improves wet strength, folding endurance, and scuff resistance to paper stock. It is fast curing.

**Description:** PR-165 resin develops about 75% of its ultimate cure by the time paper leaves the machine. Full cure is reached in 14 to 21 days. Full cure may be hastened by storing paper in a warm room.

(PR-165 is a development of the Chemical Division, The Borden Company, Dept. CP, 350 Madison Ave., New York 17, N. Y. . . or for more information check CP 7512 on handy form, pages 2 and 3.)

### Crystallizing in spherical shells, hydroquinone captures inert gases . . .

clathrate complexes give method of separating and storing argon, krypton, and xenon

Clathrates are compounds formed by relatively large molecules which hold smaller molecules or atoms within their crystal lattice. There are no chemical bonds. Dimensions of the lattice limits size of molecules that can be held. Small molecules (such as helium) will escape through the interstices.

Clathrate complexes of argon, krypton, or xenon are prepared in large steel bombs with the inert gas under high pressure. Once formed, hydroquinone clathrates are stable at room temp and pressure and can be filtered from impurities left in solution. Stability comes from the strong binding of three hydroquinone molecules.

## for Coconut Oil

## Fatty Acids

## and Methyl Esters

## rely on EL DORADO

### for PURITY SERVICE UNIFORMITY

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason you can depend on the performance of El Dorado products in your formulations. You'll find that El Dorado's standards are the highest in the industry.

FATTY ACIDS		
CAPRYLIC	ELDHICO	CAPRIC
LAURIC	COCONUT	MYRISTIC
	PALMITIC	
METHYL ESTERS		
CAPROATE	ELDO 18	CAPRYLATE
CAPRATE	COCONATE	LAURATE
MYRISTATE		PALMITATE

For samples and specifications, write  
Dept. P

### Rely on



Main office:  
311 California St., San Francisco, Calif.  
Plants:  
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 7513  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Inert gases  
the volume  
than 70 t  
only 80%  
were filled  
equivalent

Complex  
heated, d  
and used

Possible  
relatively  
where di  
Other ga  
also be e

(Informa  
305) of  
Cambridg

Softening  
of myrist  
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Uses:  
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Boiling  
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Saponi  
Acid  
Iodine  
Hydro

(Myristy  
Co., Inc  
54, N.Y  
7514 on  
two and

Looking  
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216)  
started  
the fi  
editor

Inert gases can be stored in this way. For example, the volume of argon present within crystals is more than 70 times the volume of crystals themselves. If only 80% of the available hydroquinone "cages" were filled, gas pressure within clathrate would be equivalent to 1000 psi.

Complexes decompose and release the gas when heated, dissolved, or crushed. Gas can be recovered and used in its purified form.

Possible application is in preparing inert gases in relatively pure form for gas-filled lighting tubes, where different inert gases produce different colors. Other gases such as  $\text{SO}_2$ ,  $\text{CO}_2$ ,  $\text{HCl}$ , and  $\text{C}_2\text{H}_2$ , can also be enclosed.

(Information obtained from *Industrial Bulletin* (No. 305) of Arthur D. Little, Inc., 30 Memorial Drive, Cambridge, Mass.)

#### Softening, solvent properties of myristyl alcohol allow variety of uses

**Uses:** As an ingredient of cold creams, face creams, lipsticks, suppositories, and medicated creams. Quaternaries containing the myristyl radical have proved to be excellent germicides.

**Features:** Myristyl alcohol is reported to have very good emollient (softening) and solvent properties. Its melting point is virtually the same as normal body temperature. High purity gives it a closely controlled molecular weight.

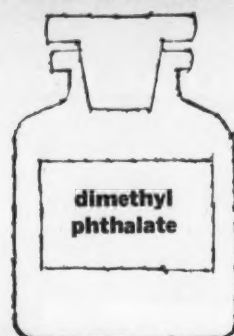
**Description:** Material is a white solid alcohol produced by fractionating a mixture of higher alcohols to separate the  $\text{C}_{14}$  alcohol. Specifications are as follows:

Appearance	White waxy solid
Melting point ( $^{\circ}\text{C}$ , min)	36
Boiling point ( $^{\circ}\text{C}$ @ 760mm, 95% boils in this range)	285-292
Saponification number (max)	1.0
Acid number (max)	1.0
Iodine number (max)	1.0
Hydroxyl number	250-260

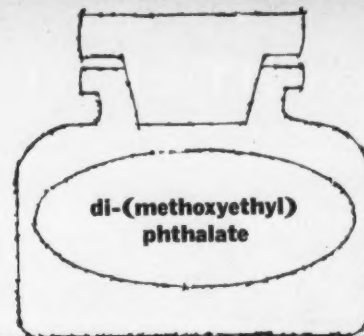
(Myristyl alcohol is a product of Aceto Chemical Co., Inc., Dept. CP, 40-40 Lawrence St., Flushing 54, N.Y. . . . or for more information check CP 7514 on handy form which is located between pages two and three.)

Looking for a chemical raw material or intermediate? . . .

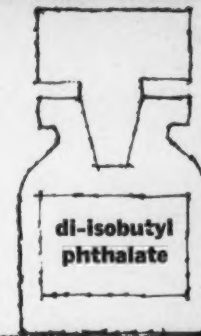
The alphabetical Product Directory (pages 213 to 216) will help you find it in a hurry. This listing, started by CHEMICAL PROCESSING in 1938, "puts the finger" on all subjects, products, equipment in editorial columns and advertisements of each issue.



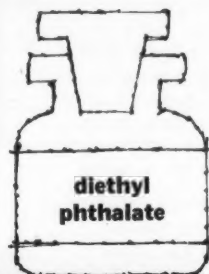
dimethyl  
phthalate



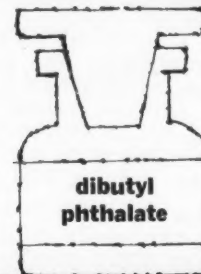
di-(methoxyethyl)  
phthalate



di-isobutyl  
phthalate



diethyl  
phthalate



dibutyl  
phthalate



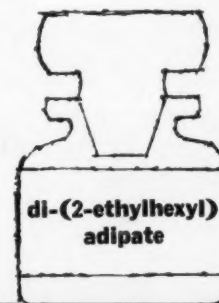
di-isobutyl  
adipate



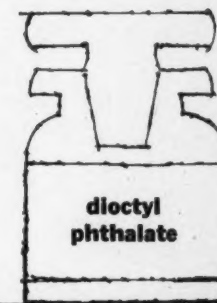
triacetin



tributyrin



di-(2-ethylhexyl)  
adipate



dioctyl  
phthalate

Eastman

## plasticizers

Call or write for your copy of our PLASTICIZERS booklet. It contains specifications, properties and typical uses for all Eastman plasticizers.

These products are stored in bulk at Kingsport, Tennessee, and Lodi, New Jersey, by Eastman Chemical Products, Inc.; by DeMert & Dougherty, Incorporated, in Chicago and St. Louis, and by Anderson-Prichard Oil Corporation in Akron and Cincinnati.

**Eastman**  
CHEMICAL PRODUCTS, INC.

KINGSPORT, TENNESSEE

a subsidiary of EASTMAN KODAK COMPANY

**SALES OFFICES:** Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast:** Wilson Meyer Co., San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.

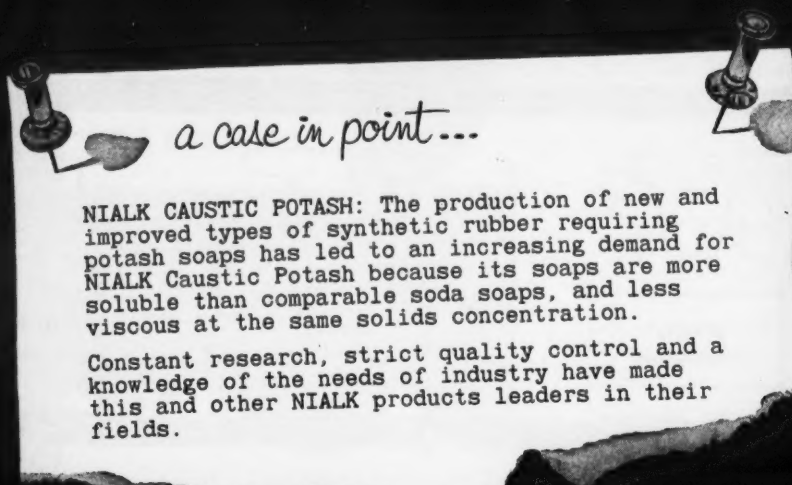
When inquiring check CP 7515 on handy form, pgs. 2-3



# Keys to efficient production

Frequently the keys to more efficient production are found in more reliable chemicals.

This is one reason why more and more users of chemicals are turning to Niagara.



**NIALK CAUSTIC POTASH:** The production of new and improved types of synthetic rubber requiring potash soaps has led to an increasing demand for NIALK Caustic Potash because its soaps are more soluble than comparable soda soaps, and less viscous at the same solids concentration.

Constant research, strict quality control and a knowledge of the needs of industry have made this and other NIALK products leaders in their fields.

## NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, New York

*Nialk*

LIQUID CHLORINE  
CAUSTIC POTASH  
CARBONATE OF POTASH  
PARADICHLOROBENZENE  
CAUSTIC SODA  
TRICHLOROethylene

NIAGATHAL (TETRACHLORO PHTHALIC ANHYDRIDE)



## MATERIALS

### High compressive strength and hardness offered by mixed borides

**Uses:** In wear-resistant field for great hardness and extremely high compressive strength. Also in high temperature applications.

**Features:** Great variety of compositions can be compounded. This affords a means of varying properties to a certain extent.

**Description:** Mixed borides are extremely intimate, almost molecular, physical mixtures of crystalline borides, such as  $TiB_2$  and  $B_4C$ , or  $ZrB_2$  and  $B_4C$ .

Hot pressed mixed borides of composition 31% (wt)  $TiB_2$ , 69%  $B_4C$ , have following properties:

Sp gr	2.89
Melting point ( $^{\circ}C$ )	2400
Comp. strength (psi)	$6 \times 10^6$
Bending strength (psi)	$9 \times 10^6$
Knoop hardness	2750

(Mixed borides are a development of Norton Co., Dept. CP, 50 New Bond St., Worcester 6, Mass. . . . or for more information check CP 7516 on handy form, pages 2 and 3.)

### Describes uses for gum karaya

Illustrated 8-page bulletin gives information about importation, processing and usage of natural gum karaya. Applications discussed include use in pharmaceutical, textile, paper, and chemical product manufacturing operations. Viscosity measurements are compared with other water soluble gums and theoretical structure of gels is treated. Use as a cold water emulsifying or thickening agent is explained in detail.

Bul G-102 is issued by Morningstar, Nicol, Inc., Natural Gum Div., Dept. CP, 630 West 51st St., New York 19, N. Y. When inquiring specify CP 7517, pages 2 and 3.



For more information on product at left, specify CP 7518 . . . see information request blank between pages 2 - 3.

# U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

## Cover Story Features Allethrin Synthesis

The cover story of the March issue of *Industrial and Engineering Chemistry* gives interesting details on an important U.S.I. accomplishment: the construction and operation of the nation's first full-scale plant for the synthesis of Allethrin, a highly effective insecticide. Photographs and two flow sheets describe the plant's 18-step process, and the present and future uses of Allethrin are discussed. The article, "Staff-Industry Collaborative Report: Allethrin," was jointly prepared by the U.S.I. technical staff and I&EC. Be sure not to miss it.



## Bone Fractures Require More Methionine to Heal

Experiments using methionine tagged with radioactive sulfur indicated that methionine metabolism increases during healing of bone fractures. The experiments were conducted on mice *in vitro* and *in vivo*.

Compared with controls, the methionine metabolism increased 3.5 times in bone fracture areas.

This work adds to the many examples of the increased need for methionine in healing processes where tissue is damaged, such as wounds and burns, as well as bone fractures.

## Use of CIPC Brings Weed Control Savings

In a recent article on the use of CIPC to control weeds in cotton, savings which more than pay for the cost of the chemical are reported. Chemical weed control is said to be the missing link in the complete mechanization of cotton production, with CIPC described as the chemical which is taking much of the hand labor out of this phase of cotton growing.

Among the important conclusions reached from work with CIPC are: weeds can be controlled in cotton more cheaply with CIPC than by other means; cotton that is kept free of weeds throughout the growing season will yield more, since there will be less competition from grass and weeds; the problem of recruiting and managing day labor has become a big headache, and most growers would like to see this eliminated; and through the use of CIPC, it is possible to get a better job of weed control with less injury to cotton than any other known method.

CIPC has many other promising uses for the control of weeds. It is being successfully used with soybeans, sugar beets, certain legumes, vegetable crops, strawberries and other crops.

U.S.I. produces both CIPC and IPC for formulators, who prepare ready-to-use herbicides for the farmer. Technical data on CIPC and IPC are available upon request.

## New U.S.I. Alkyd Promises Longer Life, Better Appearance For Exterior House Paints

Should Save Many Dollars for American Homeowners

A new U.S.I. alkyd resin promises longer-lasting and better-looking outside house paints. Called Aroplaz 1400, it is the result of more than 7 years of research and practical testing. Paints containing this new resin should bring greater

economy in home maintenance, since the major cost of painting a house is labor, not paint. From all indications, homes painted with Aroplaz 1400 paints will maintain a better looking appearance for a longer period of time. This should save money for the user by requiring less frequent repainting.

## New Process Offers Organic Peroxide Source

A new process using gum turpentine for the production of pinane hydroperoxide has been developed. Described as simple, rapid and economical, it offers a potential source of organic peroxides especially suitable for polymerization catalysts in the production of synthetic rubber, resins and plastics.

The process is said to have four main steps: hydrogenation of the turpentine to give pinane; purification of the pinane, usually by simple distillation; oxidation of the pinane to a peroxide content of about 50 percent; and stripping the oxidate under vacuum to recover the unoxidized pinane, leaving pinane hydroperoxide as a residue.

According to one of the men who developed the process, 8-pound batches of turpentine yield about 4-pounds of 80 to 90 percent pure peroxides. In earlier development work, chemists prepared a pure form of pinane hydroperoxide and established its chemical structure as *cis*-1-pinane 2-hydroperoxide.



The longer life of house paints made with new Aroplaz 1400 promises less frequent repainting and money saved for the user.

## Treated Paper Protects Food From Boring Insects

Food packaged in paper that had been treated with insecticide formulations containing pyrethrins and piperonyl butoxide (Pyreneone®) was successfully protected from boring insects in recent laboratory tests. According to the report, the treated paper gave protection for periods of time ranging from 2 months to more than a year, depending on the dosage and type of formulation.

The problem of protecting foods packaged in paper bags and packages from insects is important in the food industry. The new method of packaging in treated paper promises to be of considerable economic value to food packagers. Paper treated with the most effective formulation repelled boring insects for more than a year, while untreated papers were penetrated in about 1 week.

The report, which appeared in a leading food chemistry magazine, was prepared by the Research and Development Laboratories of U.S.I. Combinations of pyrethrins and piperonyl butoxide can be used on food containers with no toxic hazards and are marketed by U.S.I. under the registered trademark Pyreneone.

Described as a pure, low viscosity alkyd, Aroplaz 1400 can be used in white or tinted paints in place of all or part of the oil (linseed, for example) used in ordinary house paints. Alkyd resins are widely recognized for their excellent durability by the paint and varnish industry, and now with Aroplaz 1400, the paint manufacturer may successfully incorporate this valuable alkyd resin property in his house paint formulations.

## Created by Researchers

Aroplaz 1400 is the product of imaginative research work by U.S.I. As a basic producer of raw materials for the paint industry, U.S.I. continually searches for better products and improved processes. Many of these, such as Aroplaz 1400, offer paint manufacturers an opportunity to improve their products.

The new alkyd resin was created by starting with a series of fast drying, low viscosity alkyds which researchers thought potentially outstanding for use in house paints. One of these alkyds gave superior results in every way with the exception of brushing, which was rated as fair to good. Based on this background, an alkyd resin was developed possessing

MORE



# U.S.I. CHEMICAL NEWS

CONTINUED

## New Alkyd for House Paints

all the desirable properties in addition to excellent brushing characteristics. The result was Aroplaz 1400.

### Tests Show Superiority

Exposure tests show the advantages of alkyd exterior house paints over straight house paints. Cleaner, whiter surfaces are observed after exposure. Furthermore, the alkyd-base coatings are better than straight-oil paints in over-all durability. U.S.I. tests continue to add evidence that extremely high quality house paints can be produced by the use of Aroplaz 1400. Important advantages, such as improved gloss-retention, cleanliness and general appearance are apparent throughout the life of the paint. Moisture-blistering, one of the greatest causes of house paint failure, is more effectively resisted, and Aroplaz 1400 paints are superior to conventional oil house paints in freedom from metal-staining. Tests also have indicated that Aroplaz 1400 paints give equal ease of brushing.

Future uses for Aroplaz 1400 should include bulletin colors, trim paints, emulsion and awning paints in addition to house paints.

Aroplaz 1400, experimentally known as resin DX-159, is now in commercial production and is supplied at 100% solids content. Much data has been collected over the years in the testing of alkyd house paints. Detailed information, including suggested formulations, is now available to paint manufacturers who wish to make independent investigations.

For further information, paint manufacturers should write directly to the Editor of the U.S.I. Chemical News.

## New Flowmeter Saves Time

Claimed to be the first of its kind ever produced, a gyrosopic mass flow meter measures the flow of gases, liquids or slurries. The new meter reads directly in pounds per minute or tons per hour and is expected to save time for process engineers who labor long hours converting volumetric measurements.

## New Paper Gives Copies Without Carbon Paper

Paper which gives copies of business forms or letters without the use of carbon paper has been introduced. The new paper utilizes the reaction of a colorless chemical coating with a clay-like material and is expected to receive widespread use in the business world.

Advantages of the new carbonless system are said to include the elimination of smudging, speeded efficiency in handling forms, and an end to the dirt and bother of duplication with carbon paper inserts.

According to the manufacturer, two different coatings on ordinary paper are used in combination to give the desired number of copies. If, for example, an original and two copies are wanted, the underside of the first sheet is coated with the colorless chemical and the topside of the second sheet with the clay-like coating. The impact of the type-writer character or the pressure of a pencil on the first sheet drives the colorless chemical coating into contact with the clay-like coating on the topside of the second sheet. This causes an immediate chemical reaction which turns the clay-like material blue and leaves a clean, sharp impression on the second sheet. This process is repeated with the second and third sheets, the back of the second sheet also being coated with the colorless chemical. Reportedly, up to seven copies can be made on an electric typewriter.

## New Mold Release Agent Has Variety of Uses

Developed in conjunction with resin manufacturers, a new mold release or parting agent offers a variety of uses to plastic fabricators. It is described as providing a ready release from molds of polyester resins and as being useful in both large and small fabrications. The material is said to find extensive use in cold molding and is supplied as a paste in two consistencies to accommodate varying conditions and types of molds.

## TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

An improved laboratory washer, said to handle everything from over-size graduates to micro pipettes, is available. The manufacturer claims that a new series of glassware baskets extend the washer's versatility. (No. 1020)

An appetite stimulant and nutritional supplement useful in aiding appetite failures from old age or convalescence has been announced. It is said to provide balanced amounts of nutritional elements including B-complex factors and iron. (No. 1021)

A starting fluid especially suited to diesels is designed to eliminate the need for storing equipment in heated quarters to insure easy starting. Applied to the air stream of any diesel or gasolene engine, it reportedly offers sure-fire starts. (No. 1022)

A tough silicone rubber with a tear strength 2 to 3 times higher than any other silicone rubber is now in production. It is expected to find widespread use as a gasketing material in chemical processing equipment, where high temperature, pressure or vacuum exist. (No. 1023)

A new moisture determination instrument, reported to be the first advance in over twenty-five years using the xyloil or toluol distillation technique, may save enough time to pay for itself in a few months. It is described as portable and as a complete unit within itself. (No. 1024)

Cement colors which are fast to alkali are available. According to the manufacturer, they can be mixed or troweled into the cement. (No. 1025)

A chemically inert, pipe-thread sealing compound prevents spiral wicking, leakage and contamination. It is said to give a leakproof seal against fluids and gases under pressure and to be suitable for process pipe lines and apparatus. (No. 1026)

A material which loosens metal parts stuck together, such as frozen bolts, is available in an aerosol container. It is reported to penetrate into spaces as small as one millionth of an inch, soften rust and dissolve dried oil and grease. (No. 1027)

Aimed at keeping drivers awake, a coffee-flavored caffeine pill in a malted milk base is said to be neither habit-forming nor a depressant. (No. 1028)

Cold metallizing of surfaces with aluminum is possible with a mixture of finely pulverized aluminum in a plastic base. According to the manufacturer, the mixture hardens to a plastic bonded aluminum surface which can be polished, ground, drilled or bent to a 45-degree angle without chipping or cracking. (No. 1029)

## PRODUCTS OF U.S.I.

### ALCOHOLS

Amyl Alcohol (Isoamyl Alcohol)  
Butanol (Normal-Butyl Alcohol)  
Fusel Oil — Refined  
Propanol (Normal-Propyl Alcohol)

### Ethanol (Ethyl Alcohol)

Specialty Denatured—all regular and anhydrous formulas  
Completely Denatured—all regular and anhydrous formulas  
Pure—190 proof U.S.P., Absolute—200 Proof  
Solox\*—proprietary solvent—regular and anhydrous

### ANTI-FREEZE

Super Pyro\* Anti-Freeze  
U.S.I. Permanent Anti-Freeze

### ETHERS

Ethyl Ether, U.S.P.  
Ethyl Ether, Absolute—A.C.S.

### ACETONE—A.C.S.

### ANSOLS

Ansol\* M  
Ansol\* PR

### ACETIC ESTERS

Amyl Acetate—Commercial and High Test  
Butyl Acetate  
Ethyl Acetate—all grades  
Normal-Propyl Acetate

### OXALIC ESTERS

Dibutyl Oxalate  
Diethyl Oxalate

### PHTHALIC ESTERS

Diamyl Phthalate  
Dibutyl Phthalate  
Diethyl Phthalate

### OTHER ESTERS

Dialol\*  
Diethyl Carbonate  
Ethyl Chloroformate

### RESINS (Synthetic and Natural)

Arochem\*—modified types  
Arofen\*—pure phenolics  
Aroflat\*—for special flat finishes  
Aroflint\*—room temperature curing phenolic  
Aroplast\*—alkyds and allied materials  
Arapol\*—copolymer modified alkyds  
Ester Gums—all types  
Natural Resins—all standard grades

### INSECTICIDE MATERIALS

Allethrin  
CPR Concentrates: Liquid & Dust  
Piperonyl Butoxide  
Piperonyl Cyclopentene  
Pyrethrum Concentrates: Liquid & Dust  
Pyrethrum Products: Liquid and Dust  
Rotenone Products: Liquid and Dust

### INSECTIFUGE MATERIALS

Indalone\*  
Triple-Mix Repellents

### INTERMEDIATES

Acetoacetanilide  
Acetoacet-ortho-chloroanilide  
Acetoacet-ortho-toluidide  
Acetoacet-para-chloroanilide  
Ethyl Acetoacetate  
Ethyl Benzoylacetate  
Ethyl Sodium Oxalacetate

### FEED PRODUCTS

Calcium Pantothenate (Feed Grade)  
Choline Chloride  
Curbay B-G\* 80  
DL-Methionine (Feed Grade)  
Niacin, U.S.P.  
Riboflavin Concentrates  
Special Liquid Curbay\*  
U.S.I. Vitamin B<sub>12</sub> and Antibiotic Feed Supplements  
Vacatone\* 40

### OTHER PRODUCTS

Acetaldehyde  
Caustic Soda  
Ethylene  
IPC (Isopropyl-N-Phenyl Carbamate)  
CIPC  
Liquid Chlorine  
Metallic Sodium  
Methionine (Pharm.)  
N-Acetyl DL-Methionine  
Nitrocellulose Solns.  
Propionaldehyde  
Propionic Acid  
Sulfuric Acid  
Urethan, U.S.P.  
\*Reg. U.S. Pat. Off.

# U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

120 BROADWAY, NEW YORK 5, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

**Gives uses and properties of cellulose acetate**

Illustrated 31-page basic technical booklet treats properties and uses of cellulose acetate. Solvents, plasticizers and resins used with cellulose acetate are also described. Section on uses includes information about acetate specialty lacquers including starting formulas for clear and pigmented outdoor lacquers, heat-resistant paper lacquer, greaseproof wallpaper lacquer, plastic coatings, and dipping lacquers.

Bul "Cellulose Acetate" is issued on letterhead request to Cellulose Products Dept., Hercules Powder Co., Dept. CP, Wilmington, Delaware.

**Resin imparts useful characteristics to synthetic rubber formulations**

**Uses:** Processing resin for formulations of butyl, Neoprene, or GR-S synthetics.

**Features:** In butyl rubber, resin increases hardness without affecting cure. With Neoprenes, it retards scorchiness in uncured batches; in cured products, ozone resistance is improved. Resin in GR-S compounds improves elongation after oven aging.

**Description:** The synthetic hydrocarbon resin is available as friable, amber colored lumps. It is odorless and non-toxic. Melting point is 170-180°F, sp gr is 1.0, estimated mw is 630. Infrared transmission spectrum of resin is similar to that of natural rubber.

(Solarite Resin #11 is a development of Solar Compounds Corp., Dept. CP, 1200 W. Blancke St., Linden, N. J. . . . or for more information check CP 7519 on handy form which is located between pages 2 and 3.)

**Shows steps in preparing woolen, worsted fabrics**

Role of chemicals in wet operations required to convert animal fiber into end products is described in 36-page booklet. Listed in detail are steps in preparing, dyeing, and finishing woolen and worsted fabrics. For each step is shown the auxiliaries recommended to perform given functions as well as percentages of product to use under normal mill conditions.

Booklet "Auxiliaries for Wool Processing" is available on letterhead request to Antara Chemicals, Div. of General Dyestuff Corp., Dept. CP, 435 Hudson St., New York 14, N. Y.

For more information on product at left, specify CP 7520 . . . see information request blank between pages 2 and 3.



**HYDROXY ANISOLE**  
(Hydroquinone monomethyl ether)

Used in the manufacture of antioxidants and pharmaceuticals, in plasticizers, dyestuffs, and in organic syntheses.



**1,4 DIMETHOXY BENZENE**  
(Hydroquinone dimethyl ether)

Used as a fixative in perfumes, as weathering agent in paints and plastics, in the manufacture of synthetic dyes, as a sun blocking agent in lotions and creams and in organic syntheses.

INTERMEDIATES

for  
organic  
syntheses

For more information write for File No. 802. You will receive additional data regarding these versatile fine chemicals.

**ANSUL**  
Chemical Company

INDUSTRIAL CHEMICALS DIVISION • MARINETTE, WISCONSIN

*Manufacturers of*

INDUSTRIAL CHEMICALS, FINE CHEMICALS, LIQUEFIED GASES, REFRIGERANTS, REFRIGERATION PRODUCTS, AND FIRE EXTINGUISHING EQUIPMENT

When inquiring check CP 7521 on handy form, pgs. 2-3



### Thickens synthetic and natural latices . . .

pours easily; formulations maintain constant viscosity on aging

**Uses:** As a thickening agent for synthetic and natural latices, as well as water dispersions of certain polymers. It may also be used as a viscosity modifier.

**Features:** It pours easily. Thickener does not require "chop off" at proper point when being poured.

Agent maintains constant viscosity in paints on aging. It also improves brushability and aids pigment suspension.

**Description:** Thickener is an aqueous polyacrylate solution, containing 15% solids. Called Modicol VD, it is supplied as a pale yellow, viscous liquid. When tested in 2% solutions, product has a pH of 10.0 to 10.5.

(Modicol VD is a development of Nopco Chemical Co., Inc., Dept. CP, Harrison, N. J. . . or for more information check CP 7522 on handy form, pages 2 and 3.)

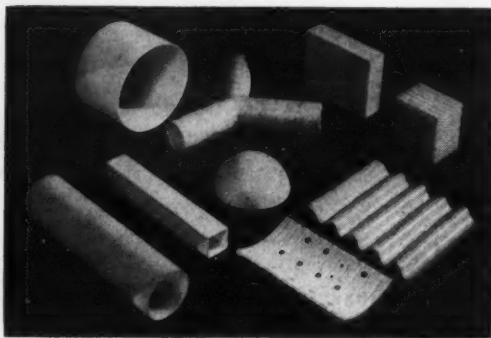
### High strength, short cure time, are the improvements listed for silicone resin . . .

bonded laminates are heat stable, water repellent, inert, and resistant to oxidation

**Uses:** Laminates prepared from resin can be used for structural parts where light weight and high strength are necessary at room or elevated temperatures. Applications include aeronautical and industrial parts. Also useful in making dielectric parts where high strength is essential.

**Features:** High physical strength, at both room and elevated temperatures. Short curing time.

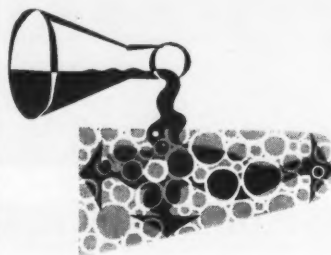
**Description:** Dow Corning 2106 is a silicone laminating resin. It is heat stable, water repellent, inert, and resistant to oxidation and to effects of most common inorganic reagents. Material is supplied as 60% resin solids in toluene, at a viscosity of 30 to 50 cp. Viscosity can be lowered by



Various parts laminated from 2106 resin

# for your information...

brief summaries of helpful product news



## Isocyanate Rigid Foams Show High Promise

Rigid foams made from Monsanto's isocyanates are now being used in more and more applications.

They have proved excellent for the protection of aircraft and ship radar antenna. They contribute to the strength of intricate spaces with little addition of weight. They can fill voids of installed process equipment and thus exclude moisture or other objectionable substances.

These are only a few of the possible applications of rigid foams. Others include their use as buoyant filler for voids in small craft, protective filler against shock and moisture for electronic equipment and as thermal insulation.

Other important features:

- Density may vary from 3 lbs. to 25 lbs. per cubic foot
- Only low capital equipment is needed
- Foam bubbles are discontinuous and the foam itself rigid
- Foams have good electrical and thermal properties
- Foams are water-resistant

Flexible foams made with Monsanto's isocyanates have numerous advantages. They save labor

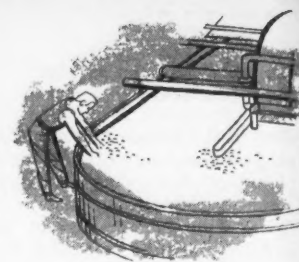
costs because they can be foamed in place. Users can avoid shaping, fitting, and transfer of the finished piece. Moreover, these foams can be made to adhere to surfaces where they are used.

For complete information, send in the coupon today.

## Pour-Point Depressant

Santopour\* C is a member of Monsanto's group of pour-point depressants for all types of wax-bearing petroleum oils. This product is economical to use and is readily soluble in mineral oils. It provides a stable pour point and can be blended easily in conventional equipment.

Write for bulletin O-90 for complete information.



## Mersize Controls Foam At Ten Points in Paper Mill

How to achieve more efficient sizing of paper and board and yet avoid foam problems? The answer is Monsanto Mersize,\* a chemical size designed to eliminate:

- beater swelling
- stock pump binding
- foam at screen
- foam at head box
- foam spots in the paper
- fiber flocculation
- foam in the wire pit
- foam at the mixing box
- foam at the seal box
- foam at the save-all

More and more mills are switching to low-foaming Mersize to overcome these troubles. Mersize increases sizing efficiency so much



## Research Chemist's Corner

### CAN THESE COMPOUNDS HELP YOU?

#### O-NITROBENZENESULFENYL CHLORIDE

**Formula:** ClS(=O)(=O)c1ccccc1[N+](=O)[O-]

#### Approximate Properties:

**Appearance and Color:** Yellow crystals  
**Crystallization Point:** 73-74° C.  
**Nature of Impurities:** Traces of HCl, g-nitrophenyl disulfide, and g-nitrochlorobenzene  
**Odor:** Slightly irritating  
**Stability:** Decomposes explosively at 170° C.  
**Solubility:** Soluble in benzene, acetic acid, and chloroform; slightly soluble in ether and carbon tetrachloride.  
**Brief statement of chemical properties:** In general, it undergoes reactions similar to acid chlorides.  
**Boiling Point:** 25  
**Refractive Index  $n_D^{25}$ :**  
**Specific Gravity @ 25°/25° C:**

#### BETA-(O-CHLOROANILINO) PROPIONITRILE

**Formula:** NC#CCc1ccc(Cl)cc1

**Liquid, colorless to red upon aging**  
**Traces of g-chloroaniline and g-chloroacetanilide**  
**Faint odor of aniline**  
**Stable**  
**Soluble in ethanol, ether, acetone, benzene and chloroform. Insoluble in water, hexane.**  
**Typical nitrile, hydrolyzable to acid derivatives. Basic nitrogen atom, forms salts.**  
**139-141° C./0.3 mm.**  
**1.5734**  
**1.2103**

Laboratory quantities available to qualified chemists.

you can usually cut your sizing costs substantially.

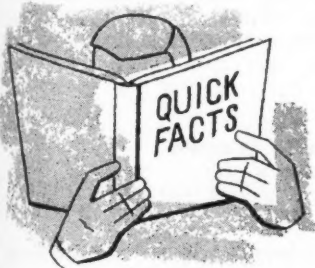
For complete information, send in the coupon.

## Rubber Chemicals Catalog Revised and Reprinted

"Monsanto Chemicals for the Rubber Industry" has just been completely revised. This 46-page catalog contains up-to-date listings of accelerators, antioxidants and special materials, along with specifications and use data.

Also included are dispersion and emulsion formulations, and a section on methods of analysis. This catalog is an informative reference book for rubber and elastomer chemists.

Send the coupon for your copy. It will be mailed to you within ten days.



## Quick Facts on Monsanto's Family of Wetting Agents

Now you can obtain all your important wetting agent needs from one sure source of supply... Monsanto.

From this one organization you can order both anionic Santomerse\* and nonionic Sterox\* wetting agents. This means you receive faster service and ordering is simplified.

Better still, because Monsanto makes a variety of different types of wetting agents you can be sure of getting dependable, impartial advice as to the one best suited to your needs.

Sterox AJ, for example, has these special advantages which make it outstanding wherever a non-ionic is needed.

- Unusually high wetting power, emulsifying properties and surface activity.
- High stability in acid and

alkaline media as well as hypochlorite.

- Faint, pleasant odor.
- Compatible with soaps as well as anionic surface-active agents. Can be used with soaps and sanitizers.

For more information on Sterox AJ or anionic Santomerse wetting agents, send in the coupon.

## Quick Facts

Monsanto is the only phenol supplier with two widely separated producing units. One is located in St. Louis; the other at Avon, California.

## Alkyl Benzene Bulletin Gives Processing Data

Useful processing information about alkyl benzene, covering the procedures for obtaining a variety of surface-active end products from sulfonation of alkyl benzene, is contained in a technical bulletin recently published by Monsanto.

Batch-type manufacturing procedures are outlined for producing sulfonates ranging from 40 percent active to as high as 88 percent active. For complete details send coupon and get your copy of technical bulletin.

## NEW SANTOCEL\* FIFTY-FOUR... Can it hold water!

SANTOCEL\* FIFTY-FOUR, Monsanto's new silica aerogel, has a unique chemical structure which makes it an ideal material for

varied applications. Its extreme porosity, lightness and chemical inertness make it ideal for such applications as:

**FLATTING:** Lacquers • Varnishes • Enamels • Free Film

**SUSPENDING AGENT:** Paint

**THICKENING:** Greases • Silicone Fluids • Printing Inks

**ANTI-CAKING:** Citric Acid • Sulphur • Napalm • DDT

**HEAT RESISTANCE:** Core Plates • Brake Linings

**DRY GRINDING DDT**

**MOLD LUBRICANT:** Rubber • Glass

**ANTI-SLIP:** Floor Wax • Rugs

**FOR MORE INFORMATION:** Send in the coupon.



\*Reg. U. S. Pat. Off.

MONSANTO CHEMICAL COMPANY 4/54  
1702 South Second Street, St. Louis 4, Missouri

Please send information on: ☐ Santocel  
☐ Sterox AJ-1-147  
☐ Alkyl Benzene-1-148

Please send: ☐ Bulletin P-144, Isocyanates  
☐ Bulletin O-90, Santopour C  
☐ Booklet, Mersize RM  
☐ Catalog, Rubber Chemicals

Name..... Title.....  
Company.....  
Street.....  
City..... Zone..... State.....

## MATERIALS

adding more toluene. Resin has good flow characteristics and, uncatalyzed, has a gel time of 5 to 10 min at 250°C. Color is light straw and sp gr at 25°C is 1.08. Shipping weight is 9.0 lb/gal.

A typical 1/8" low pressure laminate, made with 181 glass cloth bonded with 2106 resin, has a flexural strength of 50,000 psi at room temperature. Flexural strength at 500°F is 12,000 to 15,000 psi for laminates cured 6-12 hr at 480°F; 14,000 to 18,000 when cured 24 hr; and 18,000 to 20,000 when cured 48 hr. Same laminate has tensile strength of 40,000 psi at room temperature; 30,000 psi at 500°F.

(2106 resin is product of Dow Corning Corporation, Dept. CP, Midland, Michigan... or for more information check CP 7524 on handy form, pages 2 and 3.)

## Reacts as dicarboxylic acid and mercaptan...

sodium salt is 20 times less toxic than BAL

**Uses:** Product is used in rubber processing. Derivatives are used in pharmaceutical field and in coating compounds.

**Features:** Polyfunctional compound undergoes reactions typical of both dicarboxylic acids and mercaptans. With rubber, compound acts as a tackifier for GR-S, reduces color of crepe. Sodium salt is reported to be 20 times less toxic than BAL (2,3-dimercapto-1-propanol), and effective against poisoning by Bi, Hg, As, Sn, and Au. The esters can be used in air-hardening coating compounds.

**Description:** Thiomalic acid is supplied as an off-white powder, assaying 97% (min) acid. Melting point is 150°C and molecular weight is 150.15. Acid is soluble in water and alcohol, insoluble in benzene.

(Thiomalic acid is a product of Evans Chemetics, Inc., Dept. CP, 250 E. 43rd St., New York 17, N. Y. . . . or for more information check CP 7525 on handy form, pages 2 and 3.)

## Discusses high temperature dyeing of textile fibers

Research data on application of dyes to textile fibers is given in 16-page illustrated technical bulletin. Effects of temperature, pressure and time of immersion are covered. Tables, graphs, cross sectional views and bibliography are included. Dyeing of synthetic fibers is given extensive treatment.

Bul 833 is issued by Calco Chemical Div., American Cyanamid Co., Dept. CP, Bound Brook, N. J. When inquiring specify CP 7526 on handy Reader Service slip located between pages two and three.

When inquiring check CP 7523 on handy form, pgs. 2-3



Another new development using

# B. F. Goodrich Chemical raw materials



B. F. Goodrich Chemical Co. does not make this industrial filter. We supply the Geon vinyl resin only.

## CORROSION-RESISTANT PLASTIC REPLACES METAL—COSTS 66% LESS!

**H**ERE'S another new use for rigid Geon vinyl plastic—one that improved the product and saved money to boot!

Formerly, expensive metal alloys were used to make essential parts of the leaf-type, acid filter pictured. But these metal parts would be eaten by corrosion—some in a matter of hours. Costly replacements and lost time ran up expenses.

So the manufacturer tried a rigid Geon vinyl plastic. He found it not only had the required corrosion resistance, but cost 3 to 4 times less than

special metal alloys. Now the filter leaf frames, nuts and bolts holding the leaves together, rollers holding the leaves in place, heel plate and various pipe fittings are all made from rigid Geon.

Versatile Geon vinyl materials have helped solve many problems. Products made from them can be either rigid or flexible, transparent or colored. And Geon resists acids, alkalies, most solvents and other chemicals, heat and cold. Let us help you select a Geon material suited to your needs—to help you improve or develop more saleable

products. For technical information, please write Dept. GF-2, B.F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



**GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.**

**GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors**

When inquiring check CP 7527 on handy form, pgs. 2-3

## MATERIALS

### Tells use of surface active agents for industrial emulsions

Description of manufacturer's line of surface active agents, and how to choose and use them in general industrial applications, are given in .74-page brochure.

This bound guide book outlines the hydrophile lipophile balance system of choosing surface active agents. Each material has been assigned an empirical index number representing its relative attraction for oil and water. Common applications of these materials have also been given index numbers. Matching these numbers with those of the materials considerably narrows the field when seeking solution of a formulation problem.

Other chapters are devoted to polishes, petroleum products, cleaners and sanitizers, hand cleaners and protective creams, textile processing agents, and paints, resins, and lacquers. Last chapter covers general industrial applications not elsewhere classified.

Bul CD75 is available from Industrial Chemicals Division, Atlas Powder Co., Dept. CP, 904 Market St., Wilmington 99, Del.

### Improved flexibility in vinyls given by plasticizers . . .

materials are now in commercial production

Commercial production of plasticizers that are lower in volatility and offer improved flexibility permanence in vinyl compounds, has been announced. Plasticizers are manufactured from synthetic raw materials made specifically for their production.

Addition of Cabflex ODP (iso-octyl decyl phthalate), and ODA (iso-octyl decyl adipate) increases manufacturer's line of plasticizers for vinyls to ten. These include four phthalates, four adipates, an azelate, and a hydrocarbon oil plasticizer.

(Plasticizers are products of Plastics Chemicals Div., Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston 10, Mass. . . or for more information check CP 7528 on handy form, pages 2 and 3.)

### Latex paint pigment binder gives freeze-thaw stability

**Uses:** As a pigment binder in latex paints.

**Features:** Product exhibits good freeze-thaw stability. It also has unusual rheological properties and low foaming characteristics.

**Description:** Polycy 556 is a high styrene-butadiene copolymer latex having these physical properties:

Solids (%)	47-48
Viscosity (cp)	25-75
pH	9.8-10.2
Surface tension (dynes/cm)	33-35
Density (lb/gal)	8.5

Manufacturer suggests the following white paint formulation to be used as a starting point for future work:

	Per cent
Tipure R-510	21.25
Ponolith NR	5.75
Clay ASP #400	9.00
Casein (12% solution)	11.00
Water	15.75
Aroplaz 1274	2.50
Lead naphthanate (24%)	0.02
Cobalt naphthanate (6%)	0.01
Triton X100	0.14
NaOH (10% solution)	0.05

Disperse the above, using conventional paint grinding equipment. Then, agitating slowly, add:

Dowicide A & G (16%)	3.30
Polyco 556	31.23

This formulation gives a paint having 55% non-volatiles and a 70 KU viscosity, and weighing 11.3 16/gal; pH is 9.0 to 9.3.

(Polyco 556 is a development of American Polymer Corporation, Dept. CP, 101 Foster St., Peabody, Mass. . . . or for more information check CP 7529 on handy form, pages 2 and 3.)

#### High melting point and hardness exhibited by synthetic wax . . .

can be used alone or blended with other waxes

**Uses:** For applications requiring waxes of high melting point and hardness, such as paper coating, polishes, waterproofing formulations, and rubber compounds.

**Features:** Wax is compatible with almost all vegetable, animal, and mineral waxes. Melting point and hardness of wax blends containing this material are increased. Polishes compounded with this wax are capable of taking a high, durable gloss.

**Description:** SynPar waxes are high molecular weight, aliphatic hydrocarbons. They are synthesized from CO and H<sub>2</sub> by the Fischer-Tropsch process. Supplied either in flake or broken slab form, they are white and have a fine crystal structure. Physical properties are tabulated below:

	SynPar A	SynPar B
Sp gr (solid, 68°F)	0.93	0.93
(liquid, 266°F)	0.75	0.75
Melting point (°F)	220	210
Penetration (100gm/5"/77°F)	1.0	3.5
Viscosity (cs, 266°F)	10.7	7.4
Iodine number	3-5	3-5
Acid number	0	<0.1
Resistivity (ohms)	10 <sup>18</sup>	10 <sup>18</sup>
Dielectric constant	3	3
Ash (%)	<0.01	<0.01

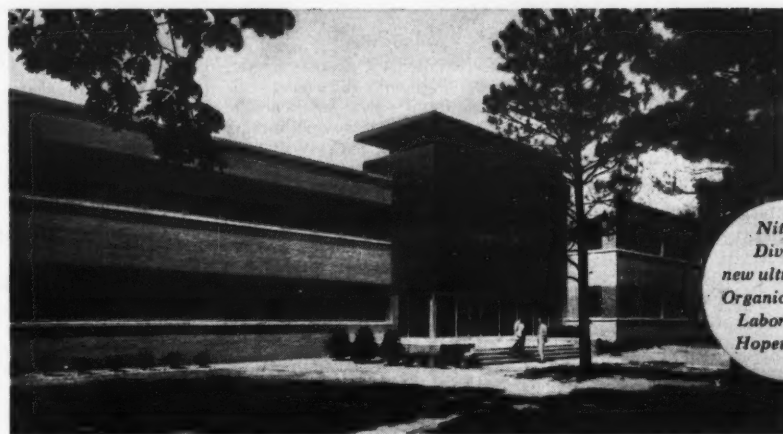
Waxes are soluble in hydrocarbons and chlorinated solvents. They are of limited solubility in alcohols.

(Synthetic waxes are distributed by H. L. Barnebey, Dept. CP, P O Box 144, Pittsburgh 30, Pa. . . . check CP 7530 on handy form, pages 2 and 3.)

## New Research Brings You Exceptionally High Purity

# Ethylene Oxide Ethylene Glycol

Diethylene Glycol  
Triethylene Glycol



Nitrogen  
Division's  
new ultra-modern  
Organic Research  
Laboratory at  
Hopewell, Va.

**Now! From our new Orange, Texas, petrochemical plant comes Ethylene Oxide, Ethylene Glycol and other derivatives of exceptionally high purity. Produced by an improved direct oxidation process, Ethylene Oxide can be purchased to advantage from Nitrogen Division. Order a trial shipment today!**

**All products are available in bulk from Orange, Texas in tank cars of 4, 6, 8 and 10,000 gallons; L.C.L. shipments available in drum and tank trucks from Edgewater, N. J., N. Y. C., Boston,**

**Chicago and Los Angeles distribution centers.**

#### Can we help you?

A member of our Technical Service Staff is available to assist you with information and help on the use of these products in your production process. A 33-page Technical Bulletin is also now available, giving you the latest advance information on the properties, uses, handling and storage of Ethylene Oxide, Ethylene Glycol and Diethylene Glycol. An invaluable handbook to anyone using Ethylene Oxide or Glycols!



## NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Ammonia  
Sodium Nitrate  
Urea  
Ethylene Oxide  
Ethylene Glycol  
Diethylene Glycol  
Triethylene Glycol  
Methanol  
Formaldehyde  
Nitrogen Tetroxide  
U.F. Concentrate -85  
Nitrogen Solutions  
Fertilizers & Feed  
Supplements

#### NITROGEN DIVISION

Allied Chemical & Dye Corporation  
40 Rector Street, New York 6, N. Y.

☐ Please send me a free copy of your valuable 33-page Technical Ethylene Products Bulletin.

☐ Have a representative visit me.

☐ Send free samples.

☐ I'm interested in \_\_\_\_\_

for the following applications. \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_ State \_\_\_\_\_

CP 4

A Better America Through Chemical Progress • CHEMICAL PROGRESS WEEK • May 17 to 22, 1954

When inquiring check CP 7531 on handy form, pgs. 2-3



## MATERIALS

### Many organic chemicals formed from methylene chloride . . .

reacts with halogens, air, water, ammonia, CO, and aromatics

**Uses:** As an organic and pharmaceutical intermediate, and as a solvent for extraction, synthetic rubbers, and paint stripping formulations.

**Features:** Compound is highly reactive in presence of a catalyst. Typical reactions are given below:

CH <sub>2</sub> Cl <sub>2</sub> reacts with	In presence of	To yield
Br <sub>2</sub>	Al	CH <sub>2</sub> BrCl + CH <sub>2</sub> Br <sub>2</sub>
Air	CuO	COCl <sub>2</sub>
Steam	Activated carbon	HCHO + other products
NH <sub>3</sub>	C <sub>2</sub> H <sub>5</sub> OH	Hexamethylenetetramine
CO	Al (pressure)	CH <sub>3</sub> ClCOCI
NaI	C <sub>2</sub> H <sub>5</sub> OH	CH <sub>3</sub> I
C <sub>6</sub> H <sub>6</sub>	AlCl <sub>3</sub>	(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> CH <sub>2</sub>

**Description:** Methylene chloride is non-flammable and relatively non-toxic. It is a clear, volatile liquid having the following physical properties:

Boiling Point (°C @ 760mm)	39.8
Freezing point (°C @ 760mm)	-96.7
Sp gr (@ 20°C)	1.326
Viscosity (cp @ 20°C)	0.425

(Methylene chloride is a product of Solvay Process Division, Allied Chemical and Dye Corp., Dept. CP, 61 Broadway, New York 6, N. Y. . . or for more information check CP 7532 on handy form, pages 2 and 3.)

### Sodium and aluminum stearates for vinyl plastigels . . .

impart thermal stability during processing and in finished products

Expanding application of metallic soaps as gelling agents is found in the field of polyvinyl chloride compositions. Sodium and aluminum stearates can be used to produce plastigels, in addition to providing a convenient way to control viscosity and achieve stability in vinyl dip and knife coating formulations. Advantage to using these soaps is combination of excellent gelling action with good heat stabilizing properties, during both processing operations and in finished products.

In preparing plastigels, manufacturer recommends incorporation of the soaps as pre-gels. These are prepared by heating and agitating soap in a portion of plasticizer until completely dissolved. Material is then cooled and milled to a smooth paste. Maximum effects are derived from preparing gels at high consistencies.

One to three parts of soap to each 100 parts of



## MANY INDUSTRIES FIND NEW USES FOR ARMOUR ETHO-CHEMICALS

By Dr. M. R. McCorkle, Technical Director,  
Armour Chemical Division

The unique properties of Armour's fat-derived surface active agents make them useful in countless industries, not only as emulsifiers, but as detergents, wetting agents, and suspending agents. These polyethylene oxide derivatives of fatty amides, fatty acids, and fatty amines are available in commercial quantities from the Armour Chemical Division under the trade names Ethomids®, Ethofats®, and Ethomeens®. Pigment dispersing, insecticide emulsifying, print and chenille soaping, paint and rust removing, buffing compounds, polishes, shampoos, hair creams, dyes are just a few of the many applications where Armour Etho-Chemicals have proved new, economical tools for industry.

### ETHOMIDS

The Ethomids are N, N-substituted fatty acid amides, the substituents being polyoxyethylene groups. In common with other fatty amides, the Ethomids are chemically neutral and rather unreactive. These compounds are stable in acid or alkaline solutions although they can be hydrolyzed with concentrated bases and acids under strenuous reaction conditions—products of such hydrolysis are fatty acids and di-polyoxyethylene amines. The Ethomids may also be esterified at the terminal hydroxyl groups of the polyoxyethylene chain.

One of the ways industry is using Armour Ethomids successfully is in preparing carnauba wax emulsions. The old method was a lengthy process, requiring two kettles to heat the water and the wax-and-emulsifier. A faster method was developed with Ethomid HT/25 in which less than one-third of the water is heated and the entire emulsion is prepared in only one kettle.

### ETHOFATS

The Ethofats are mono-fatty or rosin acid esters of polyethylene glycols. These esters are fairly stable in mildly acid or alkaline solutions. They can, however, be hydrolyzed by refluxing with strong acids or alkalis. Members of the 242/series are

somewhat more resistant to hydrolysis than the other Ethofats. The Ethofats may be further esterified at the free hydroxyl group to give polyethylene glycol di-esters. They may also be sulfated at the hydroxyl group to give sulfated esters.

Besides many applications in agriculture, the leather industry, etc., Ethofats have proved effective with paper products, performing such jobs as de-inking paper. One of the problems in reclaiming newspaper is to rid the paper of the grey cast due to retained, dispersed ink in the pulp. Ethofat 242/25 used in a reclaiming formula gave a brightness of 10 to 15 points higher measured on the G. E. Spectrophotometer. This is a brightness increase noticeable to the human eye.

### ETHOMEENS

The Ethomeens are tertiary amines having one fatty alkyl group (derived from various fatty sources having from 12 to 18 carbon atoms) and two hydroxyethyl or polyoxyethylene groups attached to the nitrogen. The Ethomeens are cationic in nature although increasing the ethylene oxide content causes these compounds to behave more like non-ionics.

The textile industry provides an interesting case of the extra advantages of Ethomeens. Ethomeen S/15 added to the mineral oil lubricant makes an excellent textile lubricant and antistatic agent. But the Ethomeen S/15 also acts as an emulsifier for the mineral oil, so that merely a warm water rinse removes the oil from the cloth. The free booklet offered in the coupon at right will help you in ordering samples of these versatile Etho-Chemicals.

### EMULSIFIERS

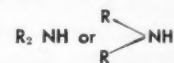
Armour has developed cationic and non-ionic emulsifiers that are not affected by water hardness. Cationic emulsifiers tend to exhaust their oil phases on, and bind them to, many types of surfaces such as wood, animal hair, cellulose and concrete. This property enhances the effectiveness of

insecticides by promoting adhesion and improving weather resistance. Ethomeens S/12 and S/15 can be combined in low concentrations to form a very effective emulsifier for 2,4-D isopropyl ester. Ethofat 142/20, another cationic, is so efficient that chlordane can be emulsified directly into water without the use of a solvent. Send for samples and data.



### FIRST TIME UNSATURATED SECONDARY FATTY AMINES EVER OFFERED TO INDUSTRY!

Two new unsaturated secondary amines produced from tallow and soya are now available for your testing. These are the first unsaturated secondary fatty amines to be offered to industry and have been made possible only by new developments in manufacturing methods. These compounds, Armeen® 2T and 2S, have the following general configuration:



Because of the unsaturation in both compounds, these two secondary amines are more easily liquefied than the corresponding saturated secondary amine (Armeen 2HT), and will show better solubility in organic solvents.

Average analyses of Armeen 2T and 2S are given here:

	ARMEEN 2T	ARMEEN 2S
Secondary Amine Content	85%	85%
Primary Amine Content	5%	5%
Neutralization Equivalent	520-540	520-540
Iodine Value	35 min.	60 min.
Temperature to Liquefy	50° to 55°C	45° to 50°C
Color	Light Tan	Light Tan

These products are so new that possible uses have not yet been explored extensively. However, the chemist acquainted with the reactivity and polar substantivity of amines and their derivatives will recognize the potentialities of Armeen 2T and Armeen 2S in corrosion inhibitors, lubricant additives, rubber processing, textile treating compounds, emulsifiers, etc. Send the coupon for samples and solubility data on these secondary amines which are available for your testing.

© ARMOUR AND COMPANY



ARMOUR CHEMICAL DIVISION

ARMOUR AND COMPANY • 1355 WEST 31ST STREET • CHICAGO 8, ILLINOIS

## NEW ANTIBACTERIAL USE FOR NEO-FAT® 10

Neo-Fat 10 (Armour's capric acid) was tested recently for antibacterial action. Neo-Fat 10 was readjusted to pH 3.5. This gave a 99.9% decrease of *M. pyogenes* var. *aureus* and *E. coli* at a concentration of 1 part in 20,000. Exposure time—10 minutes; temperature—37°C. Due to the low solubility of capric acid in water, Ethofat 242/25 was used to prepare the solution. 0.1 gm. Neo-Fat 10 was dissolved in 0.5 ml. Ethofat 242/25. This mixture was then dissolved in 100 ml. distilled water. This method can be used in low pH systems for antibacterial action.

Neo-Fat 10 is a high purity capric acid, derived by Armour's patented fractional distillation process from coconut oil. Naturally, capric acid occurs as the glyceride in various vegetable fats and oils. It is a white, crystalline substance lying between caprylic and lauric acid in the saturated fatty acid series.

Capric acid of the purity of Neo-Fat 10 is an excellent raw material for producing ketones, metallic salts, nitriles and other derivatives. Applications include the manufacture of disinfectants, anti-foaming agents, boiling solvents for paints, varnishes, enamels, waxes, etc.

Mail the coupon for free samples. Neo-Fat 10 is available in 55-gallon lacquer lined drums and in 4,000 and 8,000-gallon aluminum tank cars.



### THE DUOMEENS®

Complete data on the Duomeens—the trademark identifying Armour's fatty diamines—is offered in this booklet. Properties of these chemicals have proved valuable in many fields, such as asphalt additives, germicides, and anti-corrosion agents. Send the coupon for your free copy.

### ARMOUR CHEMICALS

This booklet is a complete catalogue of Armour's fatty acids, fatty acid derivatives, and industrial oils. Specifications, composition, solubility and compatibility are all here with many new applications for these versatile chemicals. Send the coupon for your copy. Keep it as a guide in ordering samples of Armour chemicals.

## 12-MONTH TEST PROVES ARMOUR OLEIC ACIDS UNMATCHED IN QUALITY!



A recent Armour Chemical Laboratory report reveals that Armour oleics have withstood a year of storage without breaking down! These acids had been periodically opened to the atmosphere, but they showed the same strong resistance to rancidity as the day they were made! This was proved by the Mackey test which is shown above.

Two cotton wads soaked in red oil—7 grams of cotton to 14 grams of oil—show the outstanding stability of Armour's oleic acids. The discolored swatch (right), containing a leading competitive acid, reached an internal temperature in excess of 105°C. in less than 2 hours. It took 9 hours—more than three times as long—for

the cotton on the left, containing Armour's white oleic, to reach the same point.

These extremely stable oleic acids are made by a new low-temperature solvent crystallization process. It assures you of ester-free materials which will remain resistant to oxidation and rancidity. Even during high-temperature processing, these acids remain stable.

Armour offers you quick service in 4,000 or 8,000-gallon aluminum tank cars or 55-gallon drums. Send the coupon for our oleics booklet.

Low Titer Red Oil    Low Titer White Oleic  
8-11° Red Oil        8-11° White Oleic  
Saponified Red Oil

## NEO-FAT® 65 INCREASES PRODUCTION OF HIGH-QUALITY GREASE



A double distilled animal fatty acid, Neo-Fat 65 is of a composition which for years has been recognized as advantageous for grease formulations. It is produced by the most modern methods, closely controlled

to meet rigid specifications, assuring uniform composition and greater yield. Approximately 95 pounds of Neo-Fat 65 can be substituted for 100 pounds of neutral fat to obtain the same yield. And at least two batches of soap made with Neo-Fat 65 can be run in the time required for one using glycerides. For these reasons, manufacturers can expand production without purchasing new equipment or expanding their plants. By using Neo-Fat 65, you get greater output of high quality grease—and the savings in production more than offset the slightly higher raw material cost. Send the coupon for free samples.

Send literature: ☐ Etho-Chemicals Booklet ☐ Unsaturated Amines Prod. Bull.  
☐ Coco Fatty Acids Booklet ☐ Oleic Acid Booklet  
☐ Armour Chemical Booklet ☐ Duomeen Booklet

Send samples: ☐ Armeen 2T ☐ Neo-Fat 10  
☐ Armeen 2S ☐ Neo-Fat 65

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## MATERIALS

vinyl resin are said to be sufficient for majority of coating and dipping formulations. Clay consistency for plastigels is achieved with five to ten parts of soap.

Called sodium stearate T-1 and aluminum stearate #22, both products are completely non-toxic and can be safely employed in plastic toys and other products where non-toxicity is imperative.

(Na and Al stearates are products of Witco Chemical Co., Dept. CP, 260 Madison Ave., New York 16, N. Y. . . . or for more information check CP 7534 on handy form, pages 2 and 3.)

### Add eleven to list of 3500 organic chemicals

Eleven organic chemicals, including tetrabromophenolphthalein ethyl ester—an acid-base indicator useful in titrations in anhydrous organic solvents—have recently been announced. These chemicals, added to a list of over 3500 now produced by the manufacturer, are:

1. 8-Amino-6-methoxyquinoline (pract.) (mp 49-51°C)
2. p-n-Amylphenol (bp 153-155°C/20mm)
3. Benzaldehyde methylphenylhydrazine (pract.) (mp 104-106°C)
4. Bicyclo(2,2,1)5-heptene-2,3-dicarboxylic anhydride (mp 164-166°C)
5. a-Bromo-m-nitrotoluene (mp 57-59°C)
6. 2,3-Dichloropropene (bp 92.5-95°C)
7. 2,5-Dimethoxytoluene (mp 19-20°C)
8. Ethyl anisoylacetate (bp 143-146°C/1mm)
9. 3-Ethylrhodanine (mp 36-38°C)
10. 2-Methoxyethyl acrylate (bp 58-59°C/12mm)
11. Tetrabromophenolphthalein ethyl ester (mp 206-209°C)

(Organic chemicals are a product of Organic Chemicals Dept., Distillation Products Industries, Eastman Kodak Co., Dept. CP, Rochester 3, N. Y. . . . or check CP 7535 on handy form, pages 2 and 3.)

### Data sheet lists properties, uses for phenyl ethanolamines

Technical bulletin describes phenyl ethanolamines—phenyl ethanolamine, phenyl diethanolamine, phenyl methyl ethanolamine, and phenyl ethyl ethanolamine. Physical and physiological properties, shipping data, organic solvent solubilities, uses, and potential applications are discussed.

Bul F-8280 is issued by Carbide and Carbon Chemicals Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. When inquiring specify CP 7536 on handy form, pages 2 and 3.

When inquiring check CP 7533 on handy form, pgs. 2-3





**Dependable Source  
for Chemical  
Raw Materials**



*K. V. Coombes, General Purchasing Agent, Brown Co.*

**"We're determined to lead the parade...  
and we look to our suppliers to help us"**

— K. V. Coombes, General Purchasing Agent, Brown Co.

**"ARE WE** quality conscious?" asks K. V. Coombes, General Purchasing Agent, Brown Co., Berlin, N.H. "I'll say we are! Purchasing is keenly aware of the challenge of competition. To lead the parade, our paper products have to be the best. That makes top-quality raw materials a must!

"We not only seek out the best sources for the raw materials that we do not make ourselves, but we want to know the vital statistics on our sources: What producing facilities do they have? . . . Do they own or control their own sources of raw material? . . . What

steps do they take to insure quality control? . . . Are they research-minded?

"Wyandotte has satisfied our requirements on all these points—even to owning their own sources of supply, limestone quarries, salt deposits, coal mines.

"Their Soda Ash, which we purchase, is always uniform. In the New England territory, their technical representative works very closely with us. We feel, too, that their recent expansion in research can be most helpful to concerns like ours in the years to come."

If you're gearing your business with an eye to the future, and use raw material chemicals, let Wyandotte help you. Wyandotte Technical Service extends to every industrial area of America. Write for prices, data, or helpful service. There is no obligation. Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.



Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine • Calcium Carbonate • Calcium Chloride • Glycols • Synthetic Detergents • Agricultural Insecticides • Soil Conditioners • Other Organic and Inorganic Chemicals



*Portion of Brown Co. plant, Berlin, New Hampshire.*

When inquiring check CP 7537 on handy form, pgs. 2-3

## MATERIALS

### Properties and specifications of diphenyl cresyl phosphate

Notebook-size data sheet describes properties, specifications, and uses of Celluflex 112, diphenyl cresyl phosphate. Material is recommended as a flame resistant plasticizer for polyvinyl chloride films and coatings.

(Celluflex 112 is a development of Chemical Div., Celanese Corporation of America, Dept. CP, 180 Madison Ave., New York 16, N. Y.)

Bul No. N-40-1 is available from Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring specify CP 7538 on handy form, pages 2 and 3.

### Matching of colors possible with vinyl dry blends . . .

processing temp is in 225 to 245°F range

Uses: In manufacturing vinyl plastics.

Features: Dry blends come completely formulated. Color possibilities are practically unlimited, can be duplicated to match under all light conditions. Clear to opaque products can be made.

In processing, temp from 225 to 245°F can be used. This assures heat and light stability in finished extrusions. Manufacturer states that fast extrusion rates can be used.

Description: Vinyl dry blend mixtures are supplied as dry, free-flowing, sand-like mixtures. They are available in different standard compounds; however, special compounds can be supplied if required. Blends are self-extinguishing when exposed to fire.

(Vinyl dry blend mixtures are products of Extrusion Division, Auburn Button Works, Inc., Dept. CP, Auburn, N. Y. . . or for more information check CP 7539 on handy form which is located between pages 2 and 3.)

### Crystal lattice in cubic form with stabilized zirconia . . .

silica impurity is less than 0.3 per cent

Uses: In refractory, ceramic, catalytic, abrasive, and electrical applications.

Features: Stabilizing crystal structure in the cubic form gives material excellent thermal shock resistance, as no crystal inversion takes place during extreme temp changes. Danger of mechanical failure of shapes during extreme temp fluctuations is minimized.

Electrical resistivity is high at low temp, low at high temp. Abrasion resistance is very good.

Description: Stabilized Zirconia is 93%  $ZrO_2$  (+HfO<sub>2</sub>). Per cent SiO<sub>2</sub> is less than 0.3. It has the following physical properties:

Melting  
Crystal  
Crushing  
@ 100  
@ 212  
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## MATERIALS

Melting point (°F)	Above 4700
Crystal system	Isometric
Crushing strength (psi) @ 20°C	299,000
@ 1000°C	171,000
@ 2120°C	40
Coefficient of thermal expansion (20-1000°C)	$10.5 \times 10^{-6}$
Dielectric constant	20.0
Volume resistivity (ohms per cc) @ 100°C	$10^{12}$
@ 500°C	$10^{10.4}$
Density (lb/cu ft)	250-275
Heavy refractories	160
Insulating refractories	

Grain size is uniform in range of 20-40 microns. Finer sizes down to one micron, or coarser grains are available.

(Stabilized Zirconia is a development of Zirconium Corporation of America, Dept. CP, Solon Center Bldg., Solon, Ohio . . . or for more information check CP 7540 on handy form, pages two and three.)

### **Cotton is not harmed when sprayed with weed killer . . .**

most of 1954 production going into cotton area

**Uses:** Product will be used in weed and brush killer formulations.

**Features:** Tests indicate that product can be used safely in cotton areas, with no harmful effects upon the cotton.

**Description:** Silvex is trichlorophenoxypropionic acid. It is not adapted for application until formulated in ways similar to other materials. Useful formulations include amine salts and esters. After formulation it is applied as a water spray.

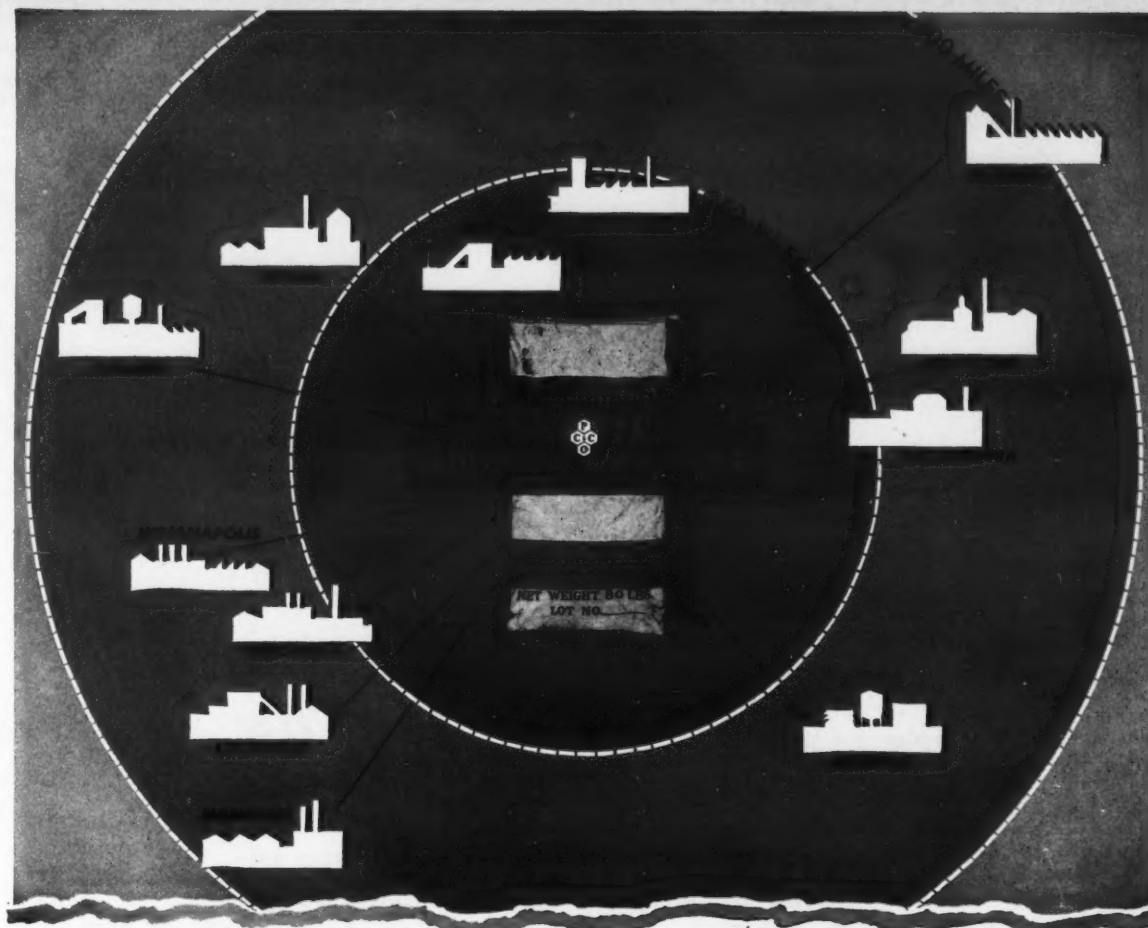
Manufacturer states that material will not be available for selective use on crops during 1954. Major share of present production is expected to be used in cotton areas, where brush control problem has been most severe.

(Silvex is product of The Dow Chemical Company, Midland, Michigan . . . or for more information check 7541 on handy form, pages 2 and 3.)

### **Tells advantages of purity in carbon raw material**

Booklet contains technical information on extra high purity carbon raw material. Used as carbon raiser, heat producer, and reducing agent, product is highly reactive and has high resistivity. Ash is claimed to be only 0.01%.

Bul "A Short Story for Carbon Users" is issued by Portland Gas & Coke Co., Dept. CP, 920 S.W. 6th Avenue, Portland 4, Oregon. When inquiring specify CP 7542 on handy form, located between pages two and three.



## **In Phthalic Anhydride PITTSBURGH is**

### *Basic in Location, too!*

If you want faster shipments and better inventory control of your phthalic anhydride, remember this: Pittsburgh is practically dead center on any map of America's great industrial heart area. So whatever your location—near Louisville or Buffalo, Chicago or Boston, you can count on practically 24-hour shipment of flake or molten P.A. from our Neville Island plant.

And here's another advantage worth considering. In one, completely integrated production cycle, Pittsburgh Coke & Chemical *quality-controls* every step of our basic production from coal to phthalic anhydride. You benefit by maximum P.A. purity, low color value and uniformly low maleic anhydride content. • We'll be glad to send you samples or technical data and assistance. *Call or write us today.*

Ammonium Sulphate  
Benzene meta, para-Cresol ortho-Cresol  
Naphthalene Phenol Phthalic Anhydride  
alpha-Picoline beta, gamma-Picoline  
Hydrochloric Acid Isonicotinic Acid  
Pyridine  
Toluene Xylene Xylenol  
Sulphuric Acid—66° and Oleum



**PITTSBURGH**  
COKE & CHEMICAL CO.

COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 7543 on handy form, pgs. 2-3



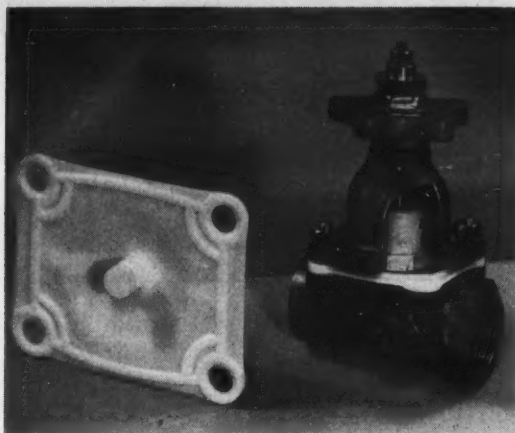


Fig 2—Saunders valve with Teflon diaphragm for operation up to 100 psi and 400°F

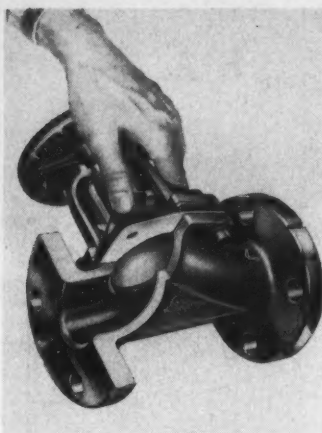


Fig 3—Another diaphragm valve useful in corrosive service

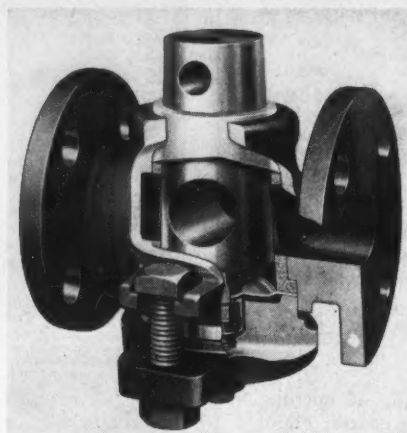


Fig 4—Fabrication of plug liner from Teflon eliminates sticking in this valve

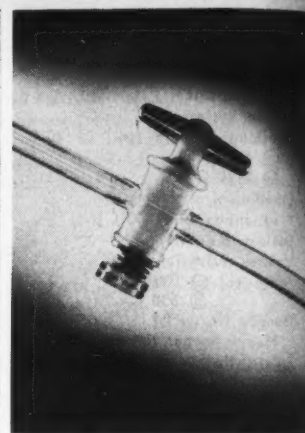


Fig 5—Stopcock is made of Teflon in valve designed for scientific use

## corrosion resistance of valves increased by use of TEFLON

**Operability and simplicity of design also improved by inertness, heat-resistance, toughness, and low friction coefficient of material**

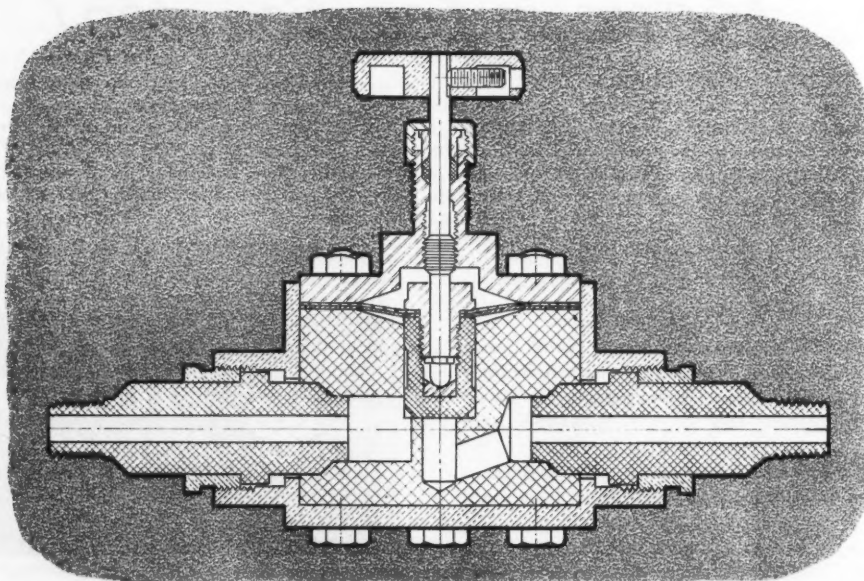


Fig 1—Recently developed all-Teflon packless valve for severe corrosive conditions

Improved corrosion resistance, due to the extreme inertness of the material, is one of the principal advantages derived from the use of Teflon in valves. Heat resistance, toughness, and low coefficient of friction of the tetrafluorethylene resin have increased valve operability and permitted greater simplicity of design. Benefits obtained from application of Teflon can best be illustrated by reference to its use in a number of individual valves.

One of the most notable recent examples of application of the resin is all-Teflon packless stop valve shown in Fig 1. This Series 1168 unit, manufactured by the Associated Valve & Engineering Co. of Chicago, is particularly suitable for highly corrosive service. Non-plasticized Teflon body is contained in a metal housing.

A similar effect has been achieved by the Resistoflex Corporation with a valve design in which the liquid or gas comes in contact only with Teflon.

Improved processing techniques for Teflon have permitted its use in diaphragms, as shown in Hills-McCanna Saunders valve in Fig 2. Unit is designed for operating pressures up to 100 psi and temperatures up to 400°F. Initial experience with this chemical and heat-resistant diaphragm indicates that valves equipped with it are useful at higher temperatures and in more corrosive service than had heretofore been possible. Grinnell Teflon diaphragm valves, Fig 3, are currently being evaluated.

In the past, manufacturers had to resort to costly fabrication and intricate design to prevent sticking or freezing of plug valves. Lubricity of Teflon solves this problem with relatively simple design.

In one case, a plug liner made of Teflon eliminates sticking, as illustrated by the Duriron Type F valve (patent pending) shown in Fig 4.

A second procedure is to make stopcock of solid Teflon, as shown in Fig 5, a valve designed for scientific use by Kontes Glass Co., Vineland, N. J.

Another application of Teflon is in gaskets and packings used in valves. Some packings have had

Fig 6—Chemical Teflon packing

a service which they are using on glass valves in some cases miniature Valve gas forms, inc as well as pregated also been Teflon, w in addition material. An interest Teflon is i chemical p

## corrosion control

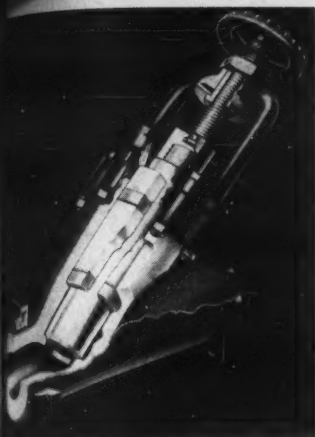


Fig 6—Chemical porcelain valve uses Teflon packing and guide ring

a service life longer than that of the valves in which they were used. Only a minimum of tightening on gland nuts is required to effect a seal, making valve operable with a minimum of torque. In some cases, packings of Teflon have made possible miniature packing glands.

Valve gaskets of Teflon are available in many forms, including solid, jacketed, and spiral wound, as well as those made of asbestos and glass impregnated with Teflon. Various packings have also been developed, such as braided and bulk Teflon, woven asbestos impregnated with the resin, in addition to extruded and molded forms of the material.

An interesting example of a packing made from Teflon is illustrated in Fig 6, showing a Tufclad® chemical porcelain valve produced by Lapp Insulator

(Continued on page 46)

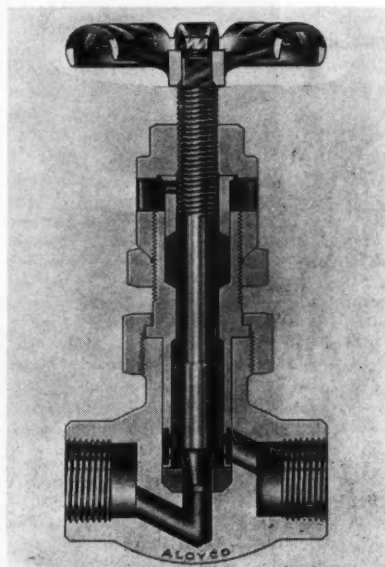
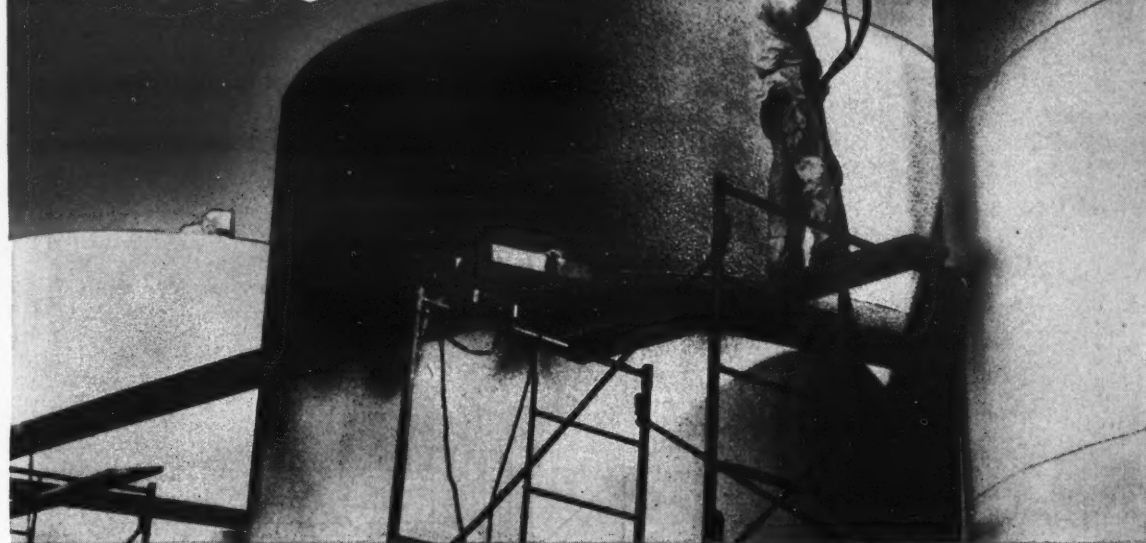


Fig 7—Teflon seat in this needle valve decreases fabrication costs

# What's going on here?



## INSUL-MASTIC, of course!

**Once and for all these Oil Refinery Tanks are  
being coated with INSUL-MASTIC TYPE "D"**

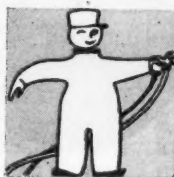
Once an INSUL-MASTIC protective coating is applied it will prevent corrosion for practically *all* time.

INSUL-MASTIC is a heavy asphaltic coating, fortified with Gilsonite and reinforced with mica, asbestos and ceramic clay. It is applied in one thick coat and will prevent corrosion under extreme conditions such as acid or alkali fumes or constant moisture. INSUL-MASTIC TYPE "D" contains cork, an excellent insulator. When applied 1/4" thick on heated tanks it will cut your fuel bills considerably.

We can show you applications many years old in plants where constant painting was once the rule. These INSUL-MASTIC coatings have not been renewed since they were applied several years ago. They have saved considerable maintenance money for their owners.

*Think first of the  
coatings that last!*

Before you build, take advantage of our consultant service. Proper coating recommendations now will prevent corrosion worries and expenses later.



# Insul-Mastic

CORPORATION OF AMERICA • OLIVER BUILDING, PITTSBURGH 22, PA.

Representatives in Principal Cities

When inquiring check CP 7544 on handy form, pgs. 2-3

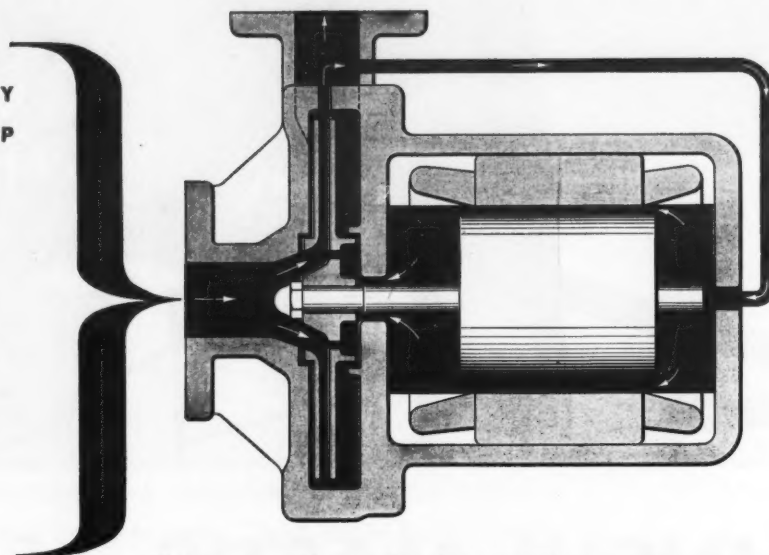


# Chempump... a centrifugal...

**has no shaft seal or stuffing box—IT CAN'T LEAK**

## TYPICAL FLUIDS EASILY HANDLED BY CHEMPUMP

Hydrofluoric Acid  
Nitric Acid  
Formaldehyde  
Trichlorethylene  
Titanium Tetrachloride  
Organic Solvents  
Carbon Disulfide  
Freon  
Dowtherm



Here's an exciting engineering concept in pumps... one that eliminates pump maintenance problems! Think of it: no shaft seal... leak proof... no stuffing box... no lubrication... totally enclosed, motor and all! Benefits? No leakage or contamination of fluids... seals-in expensive, toxic, or corrosive fluids... protects plant and personnel.

The combined rotor and impeller assembly, actuated by a radial magnetic drive is the only moving part! Fluids circulate through the rotor chamber of the motor. The stator is isolated from the fluid by a corrosion-resistant, non-magnetic alloy cylinder. And the rotor is hermetically sealed.

Chempump is available in from 1/8 up to 3 horsepower; Capacity range is from 0 to 180 gallons per minute. Discharge heads from 3 to 90 feet. Materials of construction—wide selection of alloys available. Prices start at \$96 for stainless steel construction.

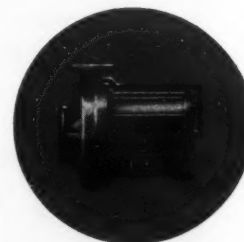
Write at once for more data on this "years-ahead" centrifugal pump.



Bulletin G-1000 contains complete data.  
Send for your copy, today.

## CHEMPUMP CORPORATION

1354 EAST MERMAID LANE • PHILA. 18, PA.



## CORROSION

### Resistance to 29 chemicals claimed for rubber-base enamel

Resistance to 29 acids, alkalis, and other corrosive chemicals encountered in industry is reported for Metakote rubber-base enamel. While primarily formulated for protection of metal, it can also be used on non-metallic surfaces.

Tests showed panel coated with material to have no damage to painted surface after 400 hr immersion in a 5% caustic solution at 77°F. For brush application only, coating dries to a smooth, high-gloss finish.

(Metakote enamel and primer are product of The Tropical Paint & Oil Co., Dept. CP, 1210-52 W. 70th St., Cleveland 2, Ohio... or for more information check CP 7546 on handy form, pages 2 and 3.)

### Tantalum resists 25% H<sub>2</sub>SO<sub>4</sub> at 250°C in tests made by Shell...

copper shows moderate resistance to attack from 5% acid

Tantalum is only material, in addition to the precious metals (gold, silver, and platinum), found resistant to sulfuric acid in 5 and 25% strengths at 220 to 250°C in tests conducted by Shell Development Company. Data for alloys tests are presented in accompanying table. Copper showed moderate resistance to attack with the 5% acid at or below 200°C, but an increase of concentration to 25% caused a marked increase in corrosion rate above 150°C. Results of tests are summarized as follows:

H <sub>2</sub> SO <sub>4</sub> Strength	Corrosion rate in mils per year		
	220°C	250°C	
	5%	25%	25%
Tantalum	—	—	<0.5
Gold	<0.5	—	2.0
Platinum	<0.5	<0.5	0.5
Silver	2.0	7.0	20.0
Copper	10	700	1500
Everdur 1010	10	—	—
Monel	530	—	—
Nickel	530	—	—
Lead	220	—	—
Type 317 SS	390	—	—
Worthite	260	—	—

#### Conditions:

0.5" diam x 8" long Pyrex tube  
3 to 6 ml of 5 or 25% aqueous sulfuric acid containing 1% ethyl alcohol  
Single specimen, 0.1 x 0.25 x 2.0" ground surface, totally immersed  
Tube evacuated at room temperature before sealing. No agitation. Duration, one day.

For more information on product advertised at right, specify CP 7547... see information request blank between pages 2 and 3.

ENGINEERING REPRESENTATIVES IN OVER 30 PRINCIPAL CITIES IN THE UNITED STATES AND CANADA

When inquiring check CP 7545 on handy form, pgs. 2-3

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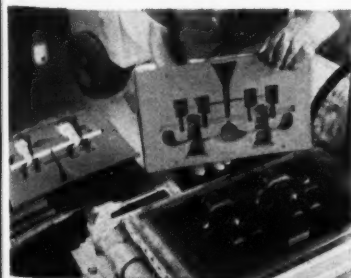
SSING

**MODERN EQUIPMENT** and closest attention to every casting detail enable new Aloyco foundry to turn out the finest corrosion-resistant valve castings made.

## New Aloyco foundry helps process industries in record expansion



**PATTERN SHOP.** In this well-equipped shop seasoned craftsmen make extremely accurate wood or metal patterns for valves of any size or complexity.



**SHELL MOLDING.** Up-to-date shell molding facilities assure users of the greatest contour accuracy in castings for small and medium-sized Aloyco valves.

During 1954, almost half the nation's total investment in new plants and equipment will go into the chemical and petroleum industries.

To meet their unprecedented needs for processing equipment, our new specially-equipped foundry will substantially increase the production of Aloyco corrosion-resistant valves.

For 25 years, Aloyco, the world's largest specialist in high alloy valves, has been helping the chemical process industries master valve corrosion problems. Alloy Steel Products Co., Inc., 1301 West Elizabeth Avenue, Linden, New Jersey.



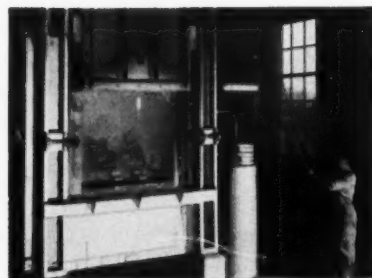
Plants: Linden, N. J.; Bloomfield, N. J.; Elizabeth, N. J.

### DISTRICT OFFICES

<b>NEW YORK 1, N. Y.</b> 350 Fifth Avenue	<b>ATLANTA, GEORGIA</b> 323 Candler Bldg.	<b>HOUSTON 6, TEXAS</b> K. E. Luger Co.
<b>WILMINGTON, DEL.</b> 226 West Ninth St.	<b>ST. LOUIS, MISSOURI</b> 1221 Locust St.	<b>SAN FRANCISCO, CALIF.</b> 2716 Donville St.
<b>PITTSBURGH 22, PA.</b> 318 Investment Bldg.	<b>CHICAGO 4, ILLINOIS</b> 332 So. Michigan Ave.	<b>LOS ANGELES 22, CALIF.</b> 5442 Jillion St.
	<b>BUFFALO 14, N. Y.</b> 3053 Main St.	



**INSPECTION AND HEAT STAMPING.** Castings are carefully inspected, their "pedigrees" stamped in. Any not 100% perfect are remelted, never welded or patched.

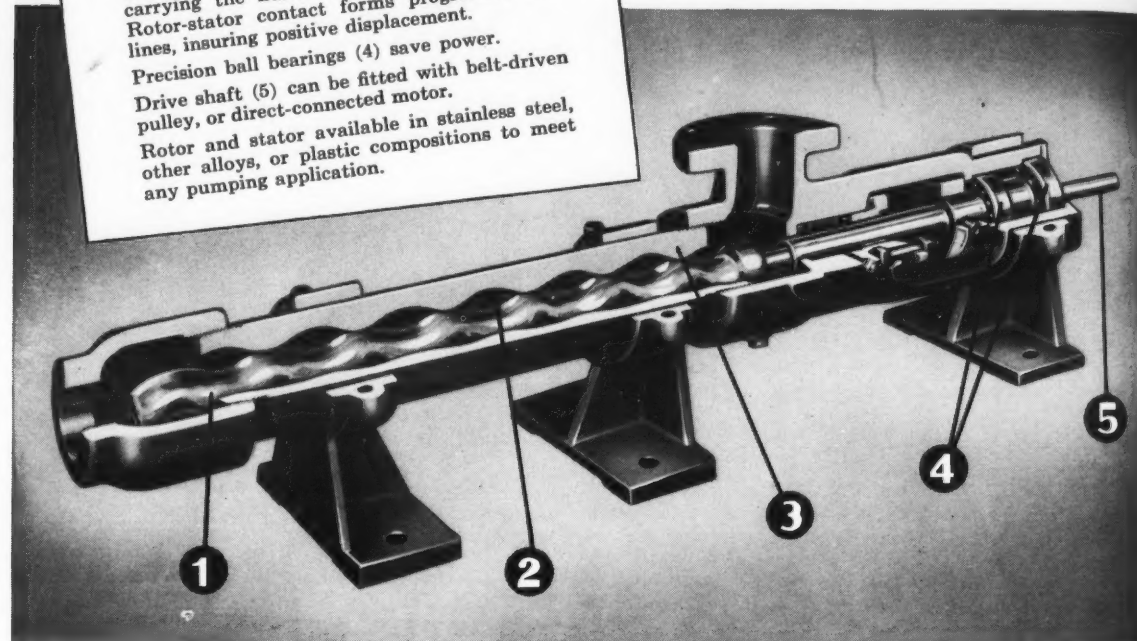


**HEAT TREATING.** After cleaning, all Aloyco austenitic type castings are heat treated and water quenched to insure maximum corrosion resistance.



**How it works:** as the rotor (1) turns, cavities (2) progress toward the end of the stator (3), carrying the fluid or semi-solid with them. Rotor-stator contact forms progressive seal lines, insuring positive displacement. Precision ball bearings (4) save power. Drive shaft (5) can be fitted with belt-driven pulley, or direct-connected motor.

Rotor and stator available in stainless steel, other alloys, or plastic compositions to meet any pumping application.



**If your pump requirements are a little different...**

## The entirely different MOYNO® Pump may be exactly what you need!

### FACTS ABOUT THE MOYNO the world's simplest pump

- **Positive Displacement**—Moynos are available to pull up to 29 inches of vacuum while discharging under pressure. Big Moynos can deliver up to 250 gallons per minute, against pressures up to 600 p.s.i.
- **Gentle**—no churning, foaming; won't break up semi-solids.
- **Reversible**—pumps with equal efficiency in either direction.
- **Trouble-Free**—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service, easy to maintain.
- **Versatile**—handles liquids, pastes, abrasive-laden slurries, vacuum applications.

**You name the problem!** Are your pumped materials viscous, semi-solid, hard to move? Do they tend to disintegrate? Are they abrasive? Do pump maintenance costs seem high? If "yes" is the answer to any of these, find out why Moyno Pumps handle jobs where other pumps fail!

**The Moyno is different!** The cutaway view above—and the facts listed at left—describe a completely new concept of pump design. They show why the Moyno is a pump you can specify, install and forget.

**Will it solve your problem?** Chances are it will... at least there isn't a more versatile pump made! Moynos pump clay for a leading pottery maker. They're being used for handling white water in paper mills... for caustics... an Eastern food producer is even using them successfully for pumping potato salad!

**Get more facts today!** An interesting, factual bulletin will tell you more about the simple, versatile Moyno Pump. Write for your free copy of Bulletin 30-CP

## ROBBINS & MYERS, INC.

SPRINGFIELD 99, OHIO • BRANTFORD, ONTARIO



Fractional & Integral h.p. Motors & Generators

Electric Fans

Electric & Hand Hoists & Cranes

Moyno Pumps

Propellair Industrial Ventilating Equipment

When inquiring check CP 7548 on handy form, pgs. 2-3

It should contain tests with corrosive substances found in sequence (Information on corrosion Miller, Shell Paper 1, 7-9)

Roof has built-in sound insulation

Uses: other buildings humidification. Features: for additional noises.

No more is installed at maintenance been planned

Description: black sheet process weather pure material into surface Deck provide for unbroken sides attractive

(Roof Corp., Pa. ... handy)

If you try to save page many your

APRIL,

## CORROSION

It should be pointed out that in all cases the acid contained a small amount of ethyl alcohol and tests were made in the absence of air. Subsequent tests in pilot scale process equipment indicated that corrosion data obtained by above tests were substantially correct. Higher corrosion rates were found with copper, however, presumably a consequence of the effect of flow velocity.

(Information extracted from technical paper, "Corrosion by Acids at High Temperatures", by R. F. Miller, R. S. Treseder, and Aaron Wachter, of Shell Development Company, Emeryville, Calif. Paper was published in "Corrosion," Vol 10, No. 1, 7-9 (1954) Jan.)

**Roof decking is mica protected, has built-in vapor barrier and sound adsorbent surface . . .**

stands up under corrosive and humid conditions

**Uses:** As roof decking for chemical plants and other buildings where corrosive atmospheres, high humidity conditions, or both prevail.

**Features:** Built-in vapor barrier eliminates need for additional layers of felt and tar under insulation. Sound adsorbent surface reduces reverberant noises.

No metal to metal contacts are made when roof is installed. All joints are self-sealed. Field painting at time of installation is not necessary, nor is maintenance or periodic painting once roof has been placed in service, manufacturer states.

**Description:** Plasteel Roof Deck is made from black sheet steel of 18, 20, or 22 gage. Special process applies three protective coatings to the sheet. First comes a bonding agent; next is a weather-sealed asphaltic-plastic coating; top coat is pure mica. Mica flakes are thoroughly imbedded into surface of asphaltic-plastic coating.

Deck panels are 24" wide. Telescoping ends provide for snug nesting of end laps, and give smooth unbroken roof surfaces. Mica coating on both sides provides excellent light reflectivity and an attractive appearance.

(Roof decks are a development of Plasteel Products Corp., Dept. CP, 15 MacAdam Ave., Washington, Pa. . . or for more information check CP 7549 on handy form, pages 2 and 3.)

If you're after a coating or special material to solve a corrosion problem . . .

try looking in the alphabetical Product Directory on page 213 to 216. Your Editors started this service many years ago, to make it easy for you to locate your interests in each issue.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

### CORROSION RESISTANCE

Media	Notes	Media	Notes
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
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Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7
Acid - Sulfuric - 10% - 120°F	7	Acid - Sulfuric - 10% - 120°F	7

302  
316  
430  
FULLY  
RESISTANT  
FOR 1000 HRS

### RESISTANCE TO SCALING

Temp, °F	Corrosion	Temp, °F	Corrosion
1200	1	1800	5
1400	2	2000	6
1600	3	2200	7
1700	4	2300	8

314

### MACHINABILITY

% of steel stock	Notes
40	6
50	7
55	8
60	9

403  
419  
430  
442  
448

# NOW!

## HERE'S THE ANSWER TO FAST ACCURATE SELECTION OF STAINLESS STEELS

CRUCIBLE

### Crucible REZISTAL STAINLESS STEEL SELECTOR

FOR MAKING THE MOST OF STAINLESS STEEL

PHYSICAL PROPERTIES  
MECHANICAL PROPERTIES  
CHEMICAL ANALYSIS

NOMINAL COMPOSITION

The answer to most of your questions about stainless steels are right at your finger tips, when you use Crucible's unique new Stainless Steel Selector.

Want to know the machinability characteristics of a stainless grade? Resistance to corrosion or scaling? Physical or mechanical properties? You can get the answers to these and other questions simply by setting the arrow on the Selector slide at the proper window. It's just as quick and easy as that.

And almost as fast as you get the answer, you can get the steel you need. For many of the REZISTAL stainless steels shown on the Selector are carried in stock in Crucible warehouses conveniently located throughout the country.

To get your free copy just fill in and mail the coupon. Better do it now.

### HOW THE SELECTOR WORKS:

Start with the problem. For example, resistance to corrosion in contact with copper sulfate. Just set the slide at the proper index number shown on the Selector (in this case on the back), and you have the answer in a second - grades 302 and 316 are fully resistant to this form of attack.

Crucible Steel Company of America  
Dept. CP, Henry W. Oliver Building  
Pittsburgh, Pa.

Name \_\_\_\_\_  
Company \_\_\_\_\_ Title \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

**CRUCIBLE**

54 years of Fine steelmaking

first name in special purpose steels

**STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.  
REX HIGH SPEED • TOOL • REZISTAL STAINLESS • MAX-EL • ALLOY • SPECIAL PURPOSE STEELS

When inquiring check CP 7550 on handy form, pgs. 2-3

APRIL, 1954

39



## Economical Bronze Design



**Series I—Heavy duty bronze rotary gear pumps**  
Oilless bearings 2-23 G.P.M.—0-100 P.S.I.

**Series II—Close coupled motor driven bronze pumps**  
Oilless bearings 2-4 G.P.M.—0-100 P.S.I.

**Series F—High volume bronze rotary gear pumps**  
Oilless bearings 50-150 G.P.M.—0-150 P.S.I.

**Series IV—Rubber impeller bronze pumps**  
Oilless bearings 6-21 G.P.M.—0-30 P.S.I.

**Series 55—Standard bronze rotary gear pumps**  
Grease fittings 2-23 G.P.M.—0-100 P.S.I.

**Series G—Standard bronze centrifugal pumps**  
Grease fittings 2-25 G.P.M.—2-10 P.S.I.

## OBERDORFER BRONZE PUMPS

Industrial Pump Div., Oberdorfer Foundries, Inc.  
644 Thompson Rd., Syracuse, N. Y.

Address the 1954 edition of the Oberdorfer Industrial Pump catalog to:

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_

Do you want a factory representative to call ☐ Yes ☐ No

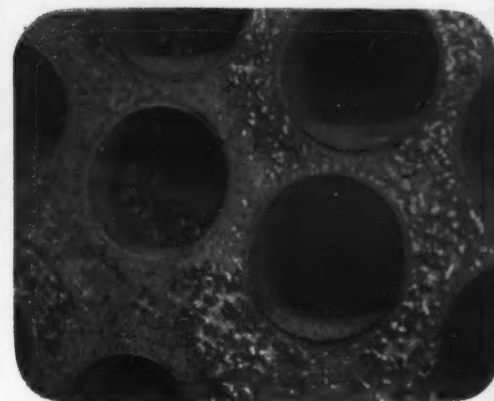
When inquiring check CP 7551 on handy form, pgs. 2-3

## corrosion control



Condenser head (shown above) which failed and required replacement

Corrosion of tube ends presented an even more serious problem



## cathodic protection eliminates condenser failures

**No visible corrosion found on units protected by magnesium anodes after five years at Dow's Texas Division**

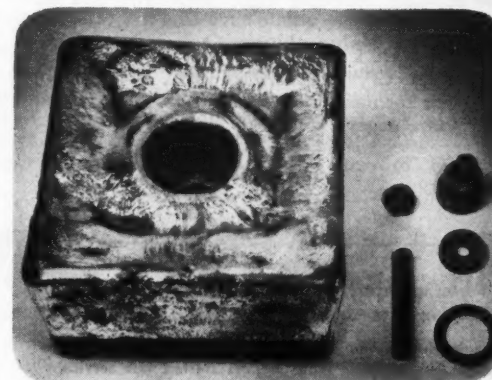
**Problem:** At the Freeport, Texas, plant of the Dow Chemical Company, service life of condensers was running far short of expectations. Failures were due to excessive corrosion in cast iron water boxes of condensers. Condensers are of the type in which sea water — used as the cooling medium — circulates on inside of tubes through water boxes on either end, while product is on the outside. Products being handled include ethylene glycol, ethylene oxide, ethylene dichloride, steam condensate, and caustic.

Attack on problem tested several possibilities: painting, rubber linings, substitution of corrosion-resistant alloy for cast iron in water box fabrication, cathodic protection by zinc, cathodic protection by magnesium. Study showed:

Few paint coatings tried had appreciable life. On some that did last, pinholes formed and caused deep pits. These coatings concentrated corrosion

in broken areas, shortening life of the exchangers.

A new and more serious aspect of the problem came to light in study of rubber-lined and corrosion-resistant alloy water boxes. Six months of use developed corrosion in tube ends, a more serious problem because of cost of tubes. Study revealed that tube ends had previously escaped



Magnesium anode and parts developed for effective protection of condensers

CHEMICAL PROCESSING

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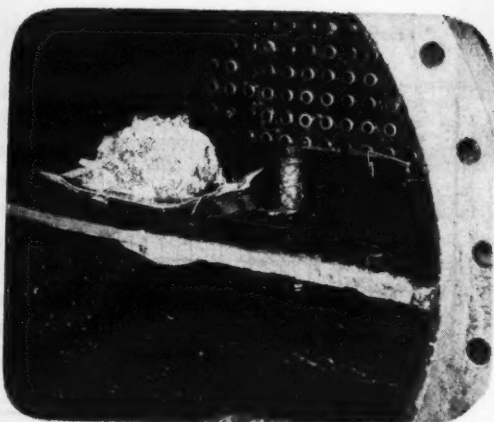
corrosion damage through cathodic protection supplied by corrosion of the cast iron water boxes. With this protection removed — by lining or resistive metals — corrosion damage was switched to tube ends.

Of the two metals tried in cathodic protection, zinc anode installed in one condenser produced results offering little promise. Initial trial of magnesium anode indicated possibility of developing a successful solution.

**Solution:** In initial test, two magnesium anodes were installed in the water box of one condenser. These anodes were semi-cylinders made by longitudinal cutting of Dow-developed anode for cathodic protection in soil applications. Anodes were installed in condensers by drilling two holes in anode, inserting studs, and welding studs to bolts in the water box.

When the box was inspected after two months of service, conclusion was that the corrosion — both in water box and in condenser tube ends — had been effectively stopped. However, it was estimated that anode life would be only three months. This would make it necessary to dismantle condensers too often; regular maintenance shutdowns are scheduled from nine months to a year.

Inspection also indicated that a better method of



Condenser placed in service in February of 1943 still showed no visible signs of corrosion when head was recently opened (rough material on walls is marine fouling)

attachment was needed. Study showed that both electrical and mechanical connection had been weakened by a galvanic coupling set up between the anode proper and the bolt assembly used to install it. In addition, severe undercutting had occurred between the magnesium and the water box, loosening the bottom section of the anode and making it ineffective.

Improvement of attachment method began with casting steel pipe cores vertically in magnesium anodes. Cores fitted over bolt studs set in water boxes and anode was fastened by a nut on each

(Continued on next page)

## Busy ALCOA Chemicals . . . are they working for you?

With these versatile ALCOA Aluminas, you have at your fingertips literally hundreds of possibilities for new product and process development. Here are a few of the current applications. Perhaps *your* research could benefit by their use. Write for information and samples to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 705-D Alcoa Building, Pittsburgh 19, Pa.

### HYDRATED ALUMINAS

#### Applications

Aluminum chemicals  
Catalysts  
Glass  
Vitreous enamels  
Pottery and china glazes  
Electrical insulators  
Rubber reinforcing pigments  
Paper coating pigments  
Water paint pigments  
Cosmetic bases  
Plastics, resins and varnish fillers  
Polishes

### TABULAR ALUMINAS

#### Applications

High quality electrical insulators  
Catalyst supports  
High temperature refractories  
Bricks  
Glass tank blocks  
Burner tips  
Mill Linings

### ACTIVATED ALUMINAS

#### Catalytic Applications

Reforming and cyclization  
Dehydrogenation  
Hydrogenation  
Cracking  
Isomerization  
Synthesis  
Destructive dehydration  
Water and sulfur-compound reactions  
Catalyst supports

### TABULAR ALUMINA BALLS

#### Applications

Catalyst bed supports  
Heat transfer operations  
Ballast

### CALCINED ALUMINAS

#### Applications

Abrasives  
Ceramics  
Optical, crystal and chemical glass  
Kiln furniture  
Refractories  
Porcelains  
Electrical insulators  
Ferrous-metal fluxes

### ACTIVATED ALUMINAS

#### Adsorption Applications

Chromatography  
As a desiccant for comfort air conditioning, and drying of liquids, gases and solids  
Transformer and lubricating oil maintenance

**ALCOA**  
**CHEMICALS**

ALUMINUM COMPANY OF AMERICA

When inquiring check CP 7552 on handy form, pgs. 2-3



(Continued from preceding page)

stud. However, water reaching area of anode-to-core joint caused detachment of core. To seal off water from this joint, top of anode was recessed to allow capping with sealing material like tar or grease. However, these sealers would not bond to magnesium to keep water out.

Problem was solved when shape of anode was changed from semi-cylinder to square, with single center-located hole instead of one at each end. Craftsmen installing anodes now had no trouble in aligning anode openings with water box bolts.

Anodes could be installed in side-by-side pairs. A plastic cap was devised that screwed down over bolt stud and core, effectively sealing off water. A resistor washer of special design, having a resistance value of from  $\frac{1}{4}$  to 1 ohm, was incorporated to restrict current and lengthen life of anode.

This anode was tried and found to be effective for periods of approximately nine months, after which new anodes are installed.

**Results:** Condensers protected by the square magnesium anodes have been in service for five years or longer with no visible signs of corrosion.

Unit illustrated was placed in service in February of 1948 and is still in excellent condition. This condenser has carbon steel heads, Monel tube sheets, and cupro nickel tubes. Sea water on tube side cools crude ethylene oxide on shell side. Temperature of inlet on tube side is 25°C, while temperature of inlet on shell side is 80°C.

(For further information on magnesium anodes contact The Dow Chemical Co., Midland, Mich. . . . check 7553 on handy form; pages 2 and 3.)

### Non-plasticized polyvinyl chloride needle, plug, and globe valves for corrosives

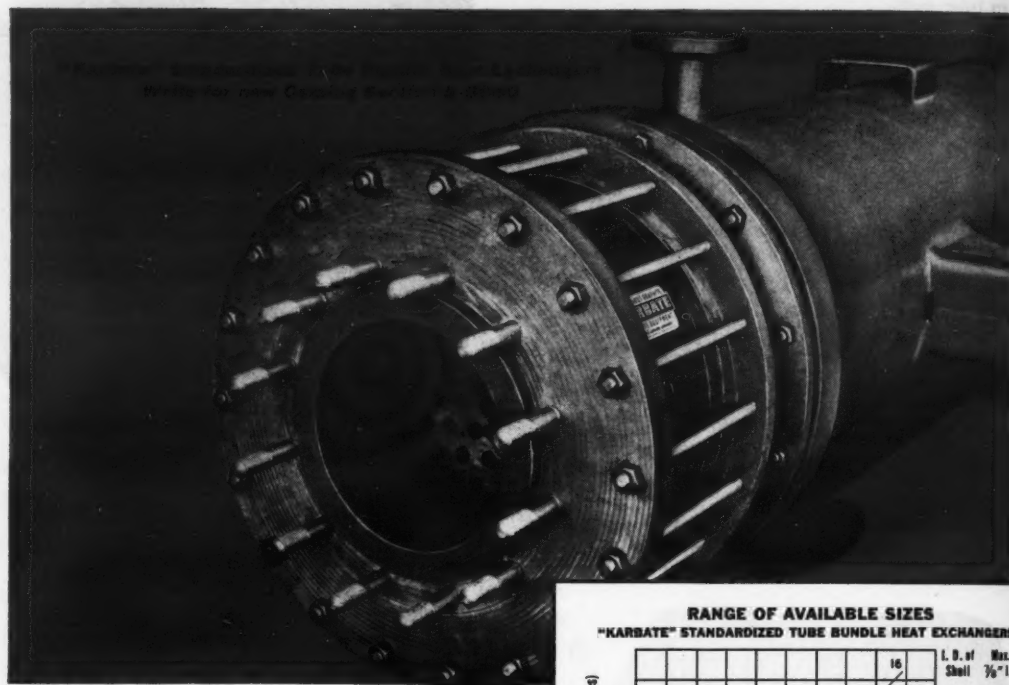
Complete line of non-plasticized Type I PVC needle, plug, and globe valves in sizes from  $\frac{1}{8}$  to 2" can be used for corrosive applications. Units supplement manufacturer's Ampcoflex Type I and Pee Vee Cee Type III sheet, pipe, and fabricated



structures: Ampcoflex sheet is available in thicknesses up to 1" in sizes as large as 48 x 108" and pipe in IPS sizes up to 6" OD.

(Valves, sheet, and piping are products of The Atlas Mineral Products Co., Dept. CP, Mertztown, Pa. . . . or for more information check CP 7554 on handy form, pages 2 and 3.)

# CUT YOUR COST.....



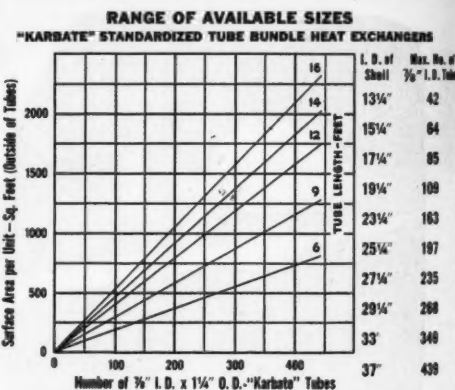
## NEW STANDARDIZED HEAT-EXCHANGER DESIGN GIVES YOU:

- LOWER FIRST COST...through quantity production
- MORE AREA PER UNIT...to 2300 square feet per tube bundle
- CHOICE OF TUBE LENGTHS...6, 9, 12, 14, 16 feet
- FASTER DELIVERY...from extensive factory stocks

...and includes these advantages  
of "Karbate" Impervious Graphite:

- COMPLETE CORROSION RESISTANCE
- HIGH THERMAL CONDUCTIVITY
- IMMUNITY TO THERMAL SHOCK

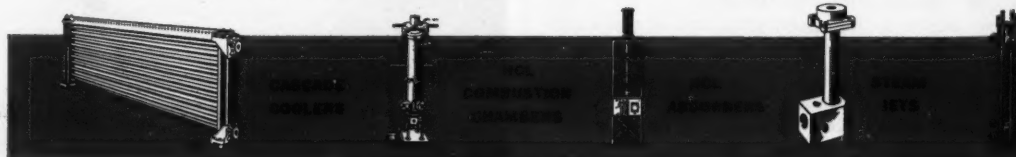
**HERE'S HOW IT WORKS:** "Karbate" impervious graphite standardized tube bundles and covers offer a range of tube surface area from 80-2300 square feet (see chart). In cooperation with National Carbon, leading heat exchanger manufacturers use these standard parts in units of their own design. A "one-best" standard, floating-end construction permits full



use of the exchanger-manufacturers' extensive experience without shell-design limitations.

Not only in severely corrosive services, but wherever corrosion is a factor, "Karbate" impervious graphite equipment offers attractive savings and operating advantages. Be certain you are taking full advantage of this versatile material of construction!

WRITE FOR NEW LITERATURE!



# T... WITH "KARBATE"

## BRAND IMPERVIOUS GRAPHITE PROCESS EQUIPMENT

NATIONAL CARBON offers from stock a complete line of "Karbate" Standard Heat Exchangers, including two shell and tube units: the "Series 90A" and the "Series 310A". Now — a choice of 9, 12, 14 or 16 foot tube lengths is available with the "Karbate" "Series 310A" standard heat exchanger, with outside tube surface areas up to 162 square feet per unit, providing a greater range of sizes and flexibility of application at lower costs per unit of area.

FEATURING improved designs in a broad range of capacities, "Karbate" pumps are your best buy for the widest span of corrosive fluids, including even mildly corrosive services. Ruggedly built, these pumps stand up under the toughest conditions, virtually eliminate pump down-time.

• You're smart to cut costs with "Karbate" impervious graphite equipment... smarter still when you save *all the way* — with "Karbate" pipe, valves and fittings. They're light in weight, unaffected by most chemicals, immune to thermal shock — perfect "go-betweens" in corrosive processes.

### WRITE FOR NEW LITERATURE!

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

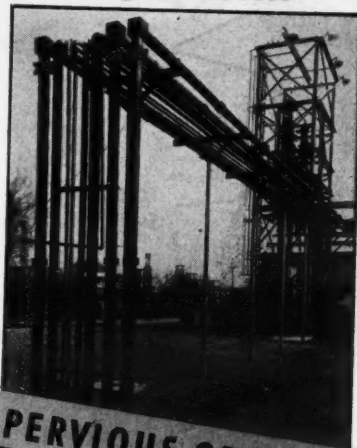
### NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation  
30 East 42nd Street, New York 17, N.Y.

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

IN CANADA: Union Carbide Canada Limited, Toronto

### "Karbate" Pipe and Fittings — Catalog Section S-7000



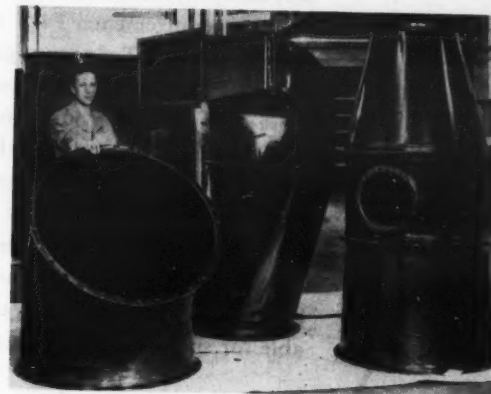
IMPERVIOUS GRAPHITE  
**KARBATE**  
PROCESS EQUIPMENT  
NATIONAL CARBON COMPANY  
A Division of Union Carbide and Carbon Corporation

## CORROSION

**Sulfuric acid, hydrogen sulfide,  
carbon disulfide fumes resisted  
by baked-on coating . . .**

flexible finish is abrasion-resistant and highly adhesive to metal

**Uses:** For coating large processing equipment exposed to chemical fumes. Cast iron strainer bodies weighing more than 1200 lb have been covered with coating. It can also be applied to steel grating, wire mesh screening, bolts, nuts, clamps, and messenger rings.



Fumes ducts coated with baked-on finish for corrosive service

**Features:** Coated surface withstands wear and abrasion as well as entrained sulfuric acid, hydrogen sulfide, and carbon disulfide fumes. Coating is flexible and highly adhesive to metal surfaces.

**Description:** Coating is based on vinyl resin-base plastisols. It is applied in uniform thicknesses from 1/32 to 3/16" thick. Welding or cementing of joints is not required.

(Vinyl resin-base plastisols are product of Bakelite Co., Div of Union Carbide and Carbon Co., Dept. CP, 260 Madison Ave., New York 16, N. Y.)

(Anti-corrosion coatings are supplied and also applied on chemical processing equipment by Quelcor, Inc., Dept. CP, Front and Broomall St., Chester, Pa. . . . or for more information check CP 7556 on handy form, pages 2 and 3.)

### Chemical-resistant filter medium covered in brochure

Porous Kel-F, a corrosion-resistant filter medium, is described in brochure. Material is resistant to strong acids, caustics, oxidizing agents, and common organic solvents. Engineering data presented include physical properties and minimum flow capacity curves for air and water.

Brochure T-103 is issued by Porous Plastic Filter Co., Dept. CP, Glen Cove, N. Y. When inquiring specify CP 7557 on handy form, pages 2 & 3.

When inquiring check CP 7555 on handy form, pgs. 2-3



# Teflon Packing

... "all-service"  
... maintenance-free  
in Lapp Valves

Solid, unfilled Teflon, in a wedge-ring arrangement, provides a packing for Lapp Porcelain valves which is long in serviceability, short on maintenance requirements. Each of the two sets of Teflon wedge-rings is a pair of rings—one close-fitting to the ground porcelain stem, the other to the stuffing box wall. Under gland compression they wedge to a permanently tight seal. Other types of packing material and packing arrangements are available for special requirements.

SPRING SEATING WASHERS

BRASS STEM AND THRUST BUSHING

SEATING LEVER

PORCELAIN FOLLOWER RING

MALLEABLE IRON TRIM

LAPPED SEAT

PORCELAIN GUIDE RING

TUFCLAD MOLDED FIBERGLASS ARMOR BONDED IN EPON RESIN

SOLID PORCELAIN BODY

SOLID PORCELAIN PLUG

# Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipes • Rosching Rings  
Polyethylene Chemical Propagating Pumps

Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 316 Wendell St., LeRoy, N. Y.

## CORROSION

**Stainless steel filter furnished with pulsation damper . . .**

device is redesigned with shorter length

**Uses:** For gage and governor lines.

**Features:** Device has been redesigned to a shorter length and equipped with a stainless steel filter to prevent corrosion.

**Description:** Body of pulsation damper is all brass for 3000 psi operating pressure. For 6000 psi, body is steel and microvalve stainless steel; while for 10,000 psi, unit is all stainless. Valve



Smooths line flow, damps pulsation, and makes gage pointer more steady

has a 96 to 1 taper to eliminate stem and screw compression strain. When installed ahead of gage or governor, jitters of gage pointer are minimized, pulsation is damped, and line flow is smoothed. Device is made with female threads, 1/4 or 1/2".

(Micro-Bean pulsation damper is product of J. A. Campbell Co., Dept. CP, 645 E. Wardlow Rd., Long Beach 7, Calif. . . . or for more information check CP 7559 on handy form, pages 2 and 3.)

**Hardenable, high strength cast form of stainless steel alloy increases design flexibility . . .**

has minimum tensile strength of 180,000 psi and min yield strength of 165,000 psi

Production of DC-50 castings is said to answer the demand for a hardenable alloy having excellent corrosion resistance, but in high strength cast form. Greater design flexibility is achieved by availability of the metal in cast form. Essentially it is same as Armco 17-4 PH except that this alloy previously has been produced in wrought form only. In hardened form, cast alloy has a minimum tensile strength of 180,000 psi and a minimum yield strength of 165,000 psi.

## CORROSION

Hardness of alloy is secured by a "solution" heat treatment. This is achieved in one of two ways: treating at 1900°F for a half-hour and then oil quenching, or heating in temperature range of 850 to 900°F for one hour and then air cooling. Advantage of low temperature hardening treatment is elimination of cracking, distortion, or scaling. Physical properties for the two methods follow:

	1900°F—1/2 hr oil-quenched	850-900°F—1 hr air cooled
Ultimate strength, psi tension	135-165,000	180-210,000
Yield strength, .2%,-psi, tension or compression	95-125,000	165-200,000
Elongation in 2", %	6-15	6-15
Reduction of area, %	30-60	30-60
Izod impact, ft lb		10-20
Hardness: Rockwell Brinell		C40-45 375-440

Alloy has following nominal analysis: carbon 0.05%, chromium 16.5%, nickel 4%, and copper 4%. Corrosion resistance is said to be better than that of 12-14% chromium alloy usually employed to obtain similar mechanical properties and is very close to that of common 18-8 stainless alloys. In addition to having excellent resistance to sea water corrosion and pitting, alloy is recommended by manufacturer for use where abrasive or bearing conditions exist.

Hardness of alloy makes it competitive with chromium-cobalt, tungsten alloys for cast high grade pumps, valves, and similar units which are subject to wear. Metal is readily machinable in the solution annealed condition. When hardened, it has appreciable ductility and toughness, plus strength properties.

(DC-50 alloy is produced by Donegal Mfg. Corp., Dept. CP, Marietta, Pa. . . . or for more information check CP 7560 on handy form, pages 2 and 3.)

### Small parts protected from corrosion by storage in transparent jars on rotary stands . . .

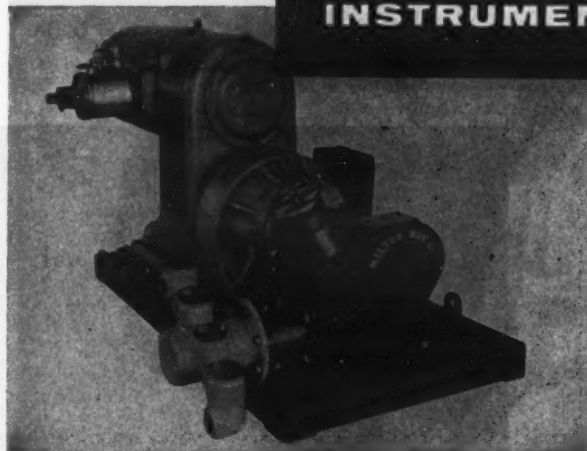
each item is easily accessible and clearly visible on compact racks

Small parts can be stored for years without corroding with use of manufacturer's rotary stand. Screws, nails, and steel parts were placed in closed glass jars used with the racks in a five year test. Not until the end of the fourth year was any oxidation found on parts in spite of frequent inspections. Parts in three of the six jars were still rust free after five years. Test was conducted in basement at 80 to 95% RH. Parts stored in open containers showed considerable rusting after two months.

Three typical rotary stands store various quantities of 198 different small parts in individual glass jars within a space three feet square and one foot deep. Each item is easily accessible and clearly visible.

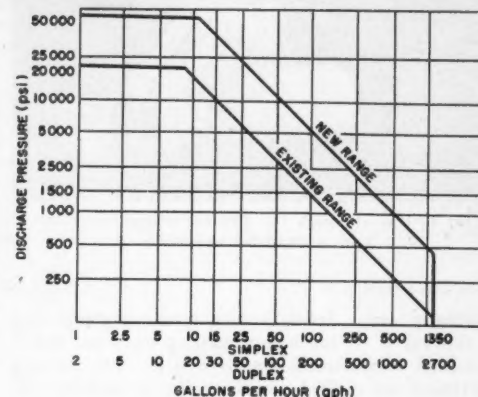
(Vu-O-Matic Rotary Stand is product of The Union Metal Manufacturing Co., Dept. CP, 1400 Maple Ave. N. E., Canton 5, Ohio . . . or for more information check CP 7561 on handy form, pages 2 & 3.)

## CONTROLLED VOLUME PUMPS ARE FLOW-CONTROL INSTRUMENTS



This particular model is used for pressures up to 7500 pounds per square inch. A pneumatic piston positioner (top left) automatically regulates pumping speed in response to a 3-15 pounds per square inch instrument air signal.

Capacity and pressure range of the HyROYmetric Controlled Volume Pump compared with former capacity and pressure range of Milton Roy Pumps.



### HERE'S THE NEW HYROYMETRIC...

For Metering Accuracy at Higher Pressures and Capacities

Here's a new Milton Roy Flow-Control Instrument—to fill the growing industrial need for precision metering of liquids in the higher pressure ranges.

Capacity range: . . . . . 1 pint to 2700 gallons per hour

Maximum pressure: . . . . . 50,000 pounds per square inch

Capacity regulation: . . . . . Manual or automatic and fully adjustable while in operation

Drive: . . . . . Air or electric motor

Materials: . . . . . Full alloy selection

The HyROYmetric is just one member of a complete line of Milton Roy Controlled Volume Pumps. Our engineering service includes sizing of equipment, proper instrumentation, panelboard design and construction, and all other details as part of the complete service available to you at no extra cost.

Reference Literature—Write for Bulletin 1153-A "HyROYmetric" and Bulletin 553 "Motor-Driven Controlled Volume Pumps."

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CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

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When inquiring check CP 7562 on handy form, pgs. 2-3





Fig 8—Use of Teflon for disc on ceramic valve results in improved operability

(Continued from page 37)

Company, Inc. Teflon is also used for guide ring in this valve. It can be operated up to 50 psi and at sustained temperatures up to 350°F. No packing lubricants are needed and necessity of stocking different kinds of specialty packing for different service requirements is eliminated.

Teflon is also used extensively as seat and disc material. In this application, tendency of material to flow under load must be considered. While this property affords some advantages in certain cases, cold flow must be limited in others.

In some applications, proper design is all that is necessary to limit cold flow of the resin. Other cases require the addition of fillers such as chopped Fiberglas, asbestos, calcium fluoride, carbon, or

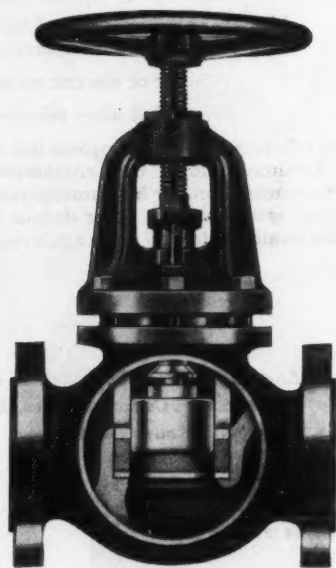


Fig 9—Sealing ring is made of Teflon in this piston valve

# Glascoote... A



Where glass weds steel for corrosive service

# ... A NEW A.O. Smith SUBSIDIARY

● **This is good news** to chemical engineers who seek dependable equipment for corrosive service.

The long experience of Glascote technicians in designing and fabricating glass-on-steel processing equipment is now combined with the parallel experience and unmatched research activities of A. O. Smith in ceramics and metallurgy.

Chemical, petro-chemical, pharmaceutical, plastics and synthetics producers will find this amalgamation of great value to them since corrosion-resistant vessels, tanks, kettles, evaporators, exchangers, and the like, have long been produced by both companies. Between them, they are responsible for an enormous volume of glass-lined steel products, including processing equipment, brewery tanks, *Permaglas* water heaters and *Harvestore* crop storage units.

**Look to Glascote** and *A. O. Smith* for the corrosion-resistant processing equipment you need . . . in standard or custom designs.

# Glascote

PRODUCTS, INC.

CLEVELAND 17, OHIO

A subsidiary of A. O. Smith Corporation

Sales offices or agents in Principal Cities  
Export Sales: A. O. Smith Corporation, International Division,  
Milwaukee 1, Wisconsin

When inquiring check CP 7563 on handy form, pgs. 2-3

## CORROSION

powdered metals. Technique most generally employed consists of grinding the molding powder together with the fillers. Much of the pioneer work along these lines was performed by the Liquid Nitrogen Processing Corporation of Chester, Pa.

Use of Teflon in disc and seat applications has, in some instances, decreased costs by eliminating necessity for lapping disc into the seat. Interchangeable valve parts and simplified design also effect economies. Its use results in improved operability where corrosive materials are being handled, as well as where high pressure differentials are encountered.

Examples of use of Teflon in seat or disc applications are shown in Fig 7, 8, and 9. Fig 7 represents a seat fabricated of the resin in a needle valve manufactured by Alloy Steel Products Co., Inc. Fig 8 illustrates a disc of Teflon on a ceramic valve made by General Ceramic and Steatite Corp. Fig 9 shows sealing ring of Teflon in a piston valve produced by Strahman Valves, Inc.

(Information on applications of Teflon in valves obtained through courtesy of E. I. du Pont de Nemours and Co., Inc., Dept. CP, Wilmington 98, Del. . . . or check CP 7564 on handy form, pages 2 and 3.)

### **Container corrosion is reduced by modifying triethanolamine lauryl sulfate . . .**

may make pressure-packed detergent shampoos commercially feasible

Modification of manufacturer's formula for triethanolamine lauryl sulfate has succeeded in reducing container corrosion in pressure-packed detergent shampoos to point where their use may be commercially feasible. Company was assisted in studies by Technical Service Laboratories of General Chemical Co., Edgewater, N. J.

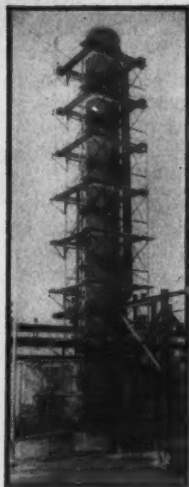
Modified product, known as Stepanol WAT, Aerated Grade, contains a corrosion inhibitor. Nature of inhibitor is not announced at this time because patent actions are not completed. Accelerated tests at 152 to 180°F showed corrosion index to be markedly reduced with the inhibitor. Room temperature tests in progress nine months so far have supported findings of the accelerated tests.

(Stepanol WAT, Aerated Grade, is product of Stepan Chemical Co., Dept. CP, 20 N. Wacker Dr., Chicago 6, Ill. . . . or for more information check CP 7565 on handy form, pages 2 and 3.)

Processing and Engineering Data

starts on page 188





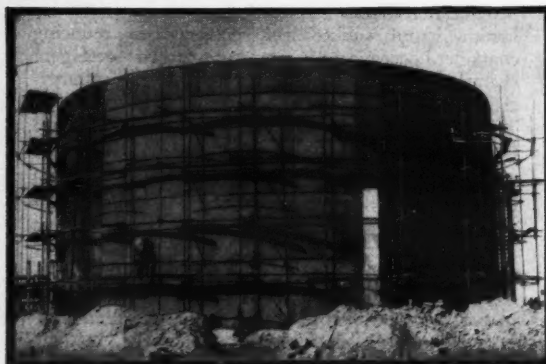
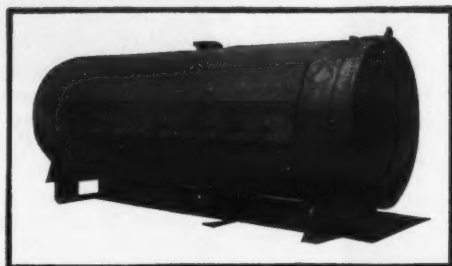
## New insulating method saves hours and hours on tanks and towers!

Imagine wrapping tanks and towers with a lightweight, flexible insulation that fits any curved or flat surface — instead of laboriously building up rigid insulating materials, block by block. Imagine further that the new method requires almost no cutting or fitting time, no expansion joints or welded rings, no pointing up.

Then imagine how much time and money this method would save you — and at once you'll see the advantages of using ULTRALITE long glass fiber

insulation blankets. It is easily applied and easily finished with weather-proofing materials. Savings are truly worthwhile, as proved time and again on oil storage tanks, asphalt truck tanks, fractionating columns, reboilers, blending tanks, etc. (And for hot or cold piping, savings are just as substantial when you use our new G-B Snap-On pipe insulation — a one-piece molded pipe insulation of fine glass fibers.)

No damage from water . . . no heat loss from "fluing action" . . . no problems when repairs are necessary — for Ultralite is resilient, reusable, won't absorb moisture.



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## ULTRALITE

... the long glass fiber insulation



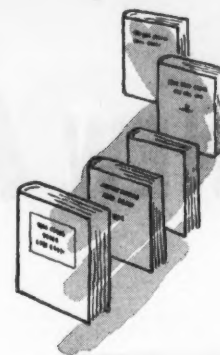
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# Recent Books



## CHROMATOGRAPHY

Reviewed by DR. LANDON A. SARVER  
American Viscose Corporation

This book is a combined and revised edition of two monographs originally written in French by Dr. Edgar Lederer and Dr. Michael Lederer of Paris, France. The translations into English were made by Dr. A. T. James of London, and the printing was done in the Netherlands. It is a beautiful book in typography and binding, and it is documented by a massive bibliography of approximately 2250 references, one of the largest yet to appear, although no effort was made to include everything previously published. It is primarily a review of papers of the past 10 or 12 years that contribute either to the development of new methods or to the application of chromatography to new groups of substances.

The classical researches of Tswett, begun in 1903, were cut short by his premature death in 1920; his work was temporarily forgotten until 1931, when Dr. R. Kuhn and Dr. Edgar Lederer touched off a renewed wave of interest that has brought about the publication of literally thousands of papers, making chromatography one of the most active fields of research today. This reviewer believes that the present volume is the most complete and authoritative work on the subject now in existence.

The book opens with a short history of chromatography; it is divided thereafter into five parts containing 40 chapters in all. Division I covers the broad field of adsorption methods, including several modifications of Tswett's technique, flowing chromatograms, frontal analysis, carrier displacement, electrochromatography, specific adsorbents, the chromatostrip, inverted chromatography, and gradient elution analysis. Useful descriptions of methods and apparatus are also given, along with illustrations that concern columns, pressure devices, fraction collectors, and industrial equipment. Adsorbents and solvents are treated at some length, as well as the relation between chemical constitution and chromatographic behavior. The chromatography of colorless substances by conversion into colored de-

rivatives, by the addition of indicators, by streaking techniques, by fluorescence, and by changes in refractive index, is also discussed.

In Division II, which deals with ion-exchange chromatography, synthetic resins, ion-exchange equilibria, elution and elution theories, separation factors, diffusion into and inside the resin, and the behavior of organic compounds on resin columns are considered.

Division III treats of partition chromatography; columns of silica gel, kieselguhr, starch and cellulose, as well as radioactive tracer techniques and gas-liquid separations, are mentioned briefly, whereas separations on filter paper are taken up at considerable length, along with descriptions and illustrations of apparatus.

In Divisions IV and V, individual separations of organic and inorganic substances, respectively, too numerous to mention here, are discussed in detail.

The book, which also contains the most complete collection of RF values yet assembled, can be highly recommended for the analytical, biological, research or industrial control chemist.

To obtain "Chromatography", remit \$9.25 direct to Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Texas. When inquiring specify CP 7567 on handy form, pages 2 and 3.

## ADHESIVES FOR WOOD

Reviewed by E. GEORGE STERN  
Virginia Polytechnic Institute

On invitation of the British Royal Aeronautical Society, Mr. R. A. G. Knight of the Forest Products Research Laboratory at Princes Risborough, England describes many aspects of jointing wood to wood, plywood, metal, and plastics with glue in a 242-page monograph which is to serve both as textbook and source of reference.

In 22 chapters, illustrated by 19 diagrams

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and sketches and 9 photographic plates and appended by a 6-page glossary and an 8-page index, the author draws from a wealth of information, bringing to the reader's attention pertinent references in bibliographies at the end of every section. The subject matter is presented in readily understandable form by reference to specific cases and applications wherever feasible.

Under the caption of glues of natural origin, the qualities and effectiveness are presented for animal glue, blood albumin, casein glue, sodium silicate, and starch and vegetable-protein derivatives. Phenol-, resorcinol-, melamine-, and urea-formaldehyde, polyvinyl-resin, and polyurethane glues are given detailed consideration as the predominately used synthetic-resin glues.

The second part of the book describes the influences of outstanding factors in glueing techniques, such as pressure application, moisture content of wood, surface and chemical treatments of wood, thermal conductivity of wood, and acidity and alkalinity of glues. Water permeability and durability of glues, skin irritation by glue, and glue identification are referred to in separate chapters. Three additional chapters, which comprise 56 pages, deal with testing glued joints in the laboratory and exposure yards.

Somewhat outside the intended scope of the book, but providing valuable background material, are three chapters, encompassing 49 pages, devoted to moisture relations of wood.

To obtain "Adhesives for Wood" remit \$5 direct to Chemical Publishing Co., Inc., Dept. CP, 212 Fifth Ave., New York 10, New York. When inquiring specify CP 7568 on handy form, pages 2 and 3.

## TOXIC SOLVENTS

Reviewed by EDGAR V. RUSSELL, JR.

Assistant Professor of Chemistry  
Virginia Polytechnic Institute

The author, Ethel Browning, M.D., states that, "the principal object of this book, written in response to a request from members of the Toxicology Committee of the Medical Research Council, has been to present in compact and easily readable form the vast amount of information available on the subject of solvents used in industry, with special reference to their field of action, their chemical properties and their potentiality for injury to those coming in contact with them".

Although "Toxic Solvents" was written for British technical men, the clear and concise

information contained therein is of equal importance to those of other nations. The objective set up by the author is accomplished in an excellent manner.

Toxic solvents are classified into chemically related groups in the beginning of the book, and a cross index of individual compounds is listed at the back. Inclusion of other names for solvents, their uses, and properties, adds value to this book, which is an authoritative reference for anyone concerned with this field, both in industry and in the college class room.

The reviewer suggests that "trimethylcyclohexanone" be used in place of "trimethylcyclohexanone" on page 105 and notes that the heading "Methyl Acetone" on page 101 gives little indication that the ensuing text deals with a mixture of solvents.

To obtain "Toxic Solvents" remit \$4 direct to St. Martin's Press, Dept. CP, 103 Park Ave., New York 17, N. Y. When inquiring specify CP 7569, pages 2 and 3.

## SPENDING FOR INDUSTRIAL RESEARCH 1951-1952

Reviewed by A. LESTER SHIPTON  
Watertown, Massachusetts

This bulletin of 103 pages is the result of three surveys made of spending for research and development by industrial companies in 1951 and 1952. The authors are DeWitt C. Dearborn, Rose W. Kneznek and Robert N. Anthony. It is published by the Division of Research, Graduate School of Business Administration, Harvard University.

The ground covered by these surveys is broad and the data were compiled from questionnaires sent to many thousands of concerns carrying on some form of research. Questions most frequently asked by executives who are interested in research and the expense involved are answered. Some 30 tables and charts are given, breaking down the data into almost every form that could be helpful to anyone wanting statistical information. Samples of the questionnaires, which show the various kinds of information requested, are included.

While this bulletin is the result of a survey and is largely statistical, the descriptions of the way the surveys were conducted show how thoroughly the subject was covered.

To obtain "Spending for Industrial Research 1951-1952" remit \$2.50 direct to Division of Research, Graduate School of Business Administration, Harvard University, Dept. CP, Boston 63, Mass. When inquiring specify CP 7570, pages 2 and 3.

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### Chemiseal Gaskets and Accessories

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Corrosion Resistant TEFLON Jacketed Gaskets for glass-lined steel connections, Corning conical flanges, etc. Chemiseal molded TEFLON Snap-on Gaskets for conical-end glass pipe assuring automatic centering of joints and free flow of materials. Chemiseal Adaptors which provide a safe, tight seal between conical-end glass pipe, glass-coated steel or similar nozzles of large inside radii and vessels of glass-lined steel, porcelain, Harex, etc.

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Bulletin TP-1053

V-Rings, Cup and Cone, and Wedge Type Packings of Chemical resistant pure TEFLON—engineered for greater flexibility and resiliency—providing necessary seal with low gland pressure, reducing torque required to operate valves. Pump packings of pure TEFLON or TEFLON impregnated with Graphite or with Mica for chemical resistant, non-contaminating service throughout the processing industries.

### Chemiseal Expansion Joints and Flexible Couplings • Bulletin FC-952

Absorb shock, vibration, thermal expansion and contraction. Correct misalignment. Connect unlike piping ends and nozzles. Chemical resistant TEFLON Bellows with integral TEFLON Gaskets.

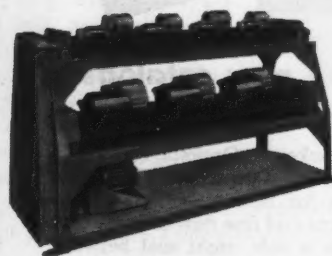


When inquiring check CP 7571 on handy form, pgs. 2-3



**BACKED  
BY THE  
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Abbé Standard  
Pebble Mill



Abbé double-tier,  
double-row Jar  
Rolling Machine

In plant after plant where pulverizing, wet or dry grinding and mixing of chemicals, drugs, cosmetics, printing inks, coatings, paints, lacquers, minerals, etc... are required, you'll find hundreds of hard-working, highly profitable installations of

### ABBÉ ENGINEERING MILLS

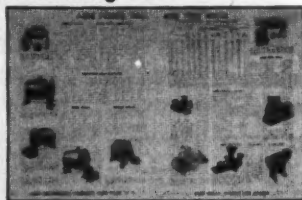
The test of time has shown what their sturdy construction, sound design and range of selection mean to the user in terms of lowest over-all operating costs, long service life and improved quality of products produced.

#### Your Choice of Types, Capacities and Drives

The Abbé Engineering line of mills includes pebble mills ranging in capacity from 40 to 13,000 lbs., jar mills for small batch work, capacities from 1 quart to 60 gallons; and jar rolling machines, made in any desired length with two, three or four rollers in single or multiple tiers, for any size, number or combination of jars.

Write for Catalog 70

It covers the entire  
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Dispersal Mixers for  
fluid mixes...and  
the Abbé Turbo Sifter  
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### ABBÉ ENGINEERING COMPANY

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## ideas

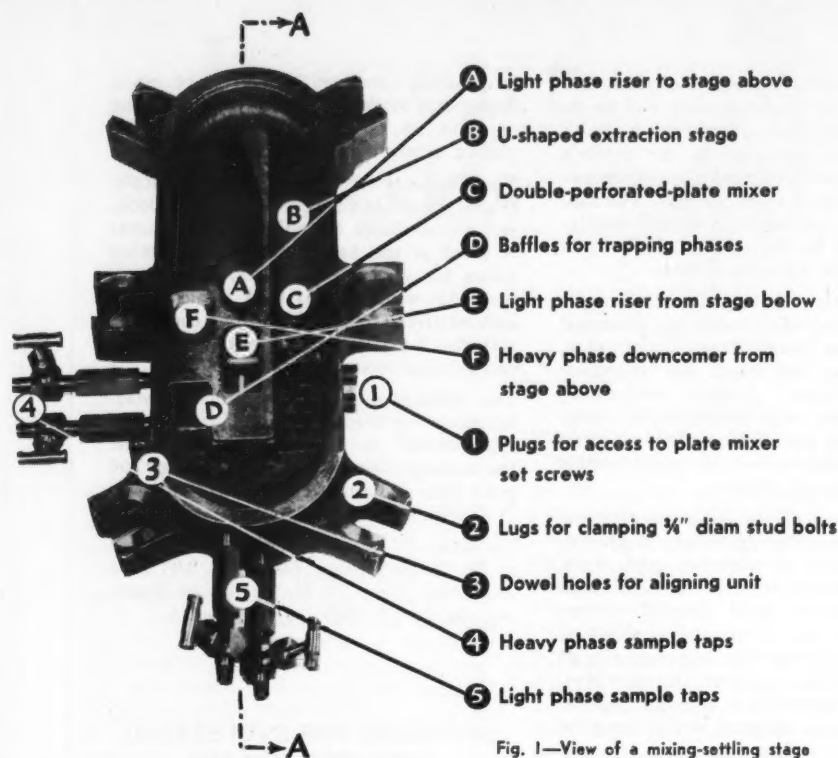


Fig. 1—View of a mixing-settling stage

## compact liquid-liquid extractor has efficiency of 95-100%

### HOW IT WORKS

Each unit consists of an even number of mixing-settling stages positioned one above the other. There are two stages to each plate, one on each side. On each stage is a U-shaped path, having three zones: mixing, settling, and separation. Fig. 2 describes one of these stages. Plate is about 3" thick and 6 x 12" in dimension. Traps are specially designed to insure proper flow of both phases, and to prevent by-passing or back-flow.

Cross-section A-A (Fig. 3) shows how light phase moves from stage to stage. If inverted, same cross-section would illustrate heavy phase movement, since flow in this case is downward. In Fig. 3, plate is covered on both sides by stage separator, containing passages for circulation of a heat transfer medium as well as conduits to conduct phases between stage-pairs.

Data show that efficiency of unit is due principally to action of perforated mixer plates and not to turbulence caused by flow through extractor. These mixers are oscillated by a common reciprocating shaft driven by a hydraulic motor. Frequency and amplitude can be regulated; so can the feed and solvent rate.

**Number of mixing stages is known —  
samples can be taken on each stage**

**Uses:** Extractor makes possible process studies on multicomponent liquid-liquid extraction systems. Unit eliminates laboratory determination of solubility and equilibrium data necessary for calculation. It can be used to determine equilibrium and operating lines for any type of dynamic liquid-liquid extraction system.

Although unit is designed primarily for pilot plant extraction work, it can be used for small scale production of organic and fine chemicals and pharmaceuticals.

**Features:** Stage efficiencies from 95 to 100% have been obtained, even at high throughputs. Mixing intensity of the two phases is independent of throughput, and can be regulated as desired.

Analyzing each phase at each stage is possible with sample valve arrangement. Valves also permit feed or solvent to be injected into any stage. This allows rapid change in number of operating stages

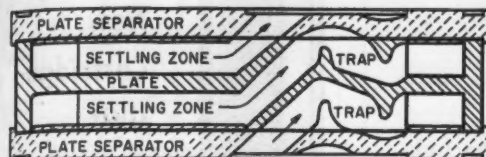


Fig. 2—SECTION A-A, Light phase risers

or in ratio between enriching and stripping stages. Capacity of unit is high, even with systems having relatively great viscosities and low differences in phase density. Small quantities of feed can be processed efficiently, as equilibrium is attained quickly. Column hold-up is 3.2 gal.

Temperature is controlled by passing heat transfer fluid through passages in the interstage heating/cooling plates. These plates are located between each pair of stages. In this way, any desired temperature gradient along column can be maintained.

Extractor has 5 to 10 times greater advantage than conventional packed towers. This figure is based on ratio of total phase throughput to holdup per theoretical stage.

**Description:** Although overall the two liquid phases flow countercurrently, flow is co-current on each individual stage after mixing and during settling. Hence the name, Mix-and-Settle Extractor.

Model 1703 NRC extractor (illustrated in Fig. 1) is a standard 20-stage unit of 304 stainless steel.

Extractor was developed jointly by Pennsylvania State College and Standard Oil Development Co.

(Mix-and-Settle Extractor is a product of Equipment Div., National Research Corp., Dept. CP, 70 Memorial Drive, Cambridge 42, Mass. . . . check CP 7573 on handy form, pages 2 and 3.)

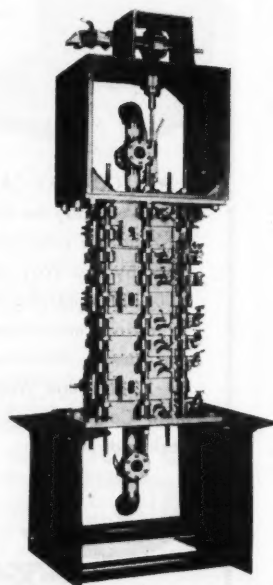


Fig. 3—Unit consists of stacked plates and top and bottom assemblies



## Take a closer look at Local Sources of Stainless Steel Tubing

You can put your trust in distributors of B&W stainless steel tubing. Their comprehensive stocks have all of the well-known qualities of B&W stainless steel tubing. B&W distributors enjoy complete support by the B&W technical staff. And B&W distributors' salesmen are trained to discuss your problems in your language . . . and to help you get the proper tube for your specific application . . . either from stock or direct from the mill.

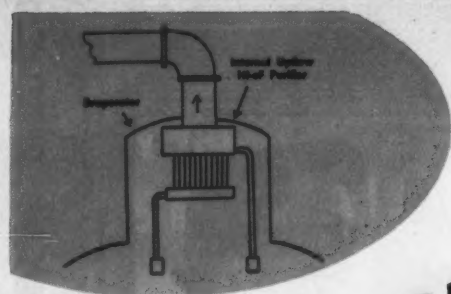
**THE BABCOCK & WILCOX COMPANY**  
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Alliance, Ohio—Welded Carbon Steel Tubing



TA-1814(G)

When inquiring check CP 7574 on handy form, pgs. 2-3





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Anderson has the answers to entrainment problems that accompany chemical processing and the utilization of air, gases and steam. Hi-eF Purifiers provide a new, economical way of preventing valuable liquids and solids from leaving processing vessels. They also prevent slugs, dirt and moisture from damaging turbines and engines. And by keeping air clean they keep pneumatic control and tool replacement costs down

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When inquiring check CP 7575 on handy form, pgs. 2-3

**IDEAS**

**Carpets get latex backing  
in two minute operation...**

parabolic reflectors of infrared tube oven bring heat source close to work

Chenille carpet manufacturer vulcanizes latex backing in two minutes using infrared "Pyrex-brand"



tube oven. Carpeting is coated as it goes through a roller-coater, bottom side up and then is passed under "Pyrex-brand" tubes of the oven.

A space of 3" is maintained between the tubes and carpeting. Closeness of work is possible because of parabolic reflector design. Reflector gives uniform heat pattern and does not give hot spots sometimes encountered in other type infrared generators.

Bringing heat source closer to work results in a reduced power consumption. Carpet travels through oven on conveyor at rate of 12 feet per minute, vulcanizing latex backing in two minutes.

(Infrared "Pyrex" tube ovens are product of Corona Manufacturing Corp., Dept. CP, 5210 San Fernando Rd., Glendale, Calif. . . . or for more information check CP 7576 on handy form, pages 2 and 3.)

**Information on cost of maintaining  
individual pieces of equipment  
important in plants...**

successful maintenance program also requires a firm stand to develop teamwork

On the road to better maintenance and lower costs, it is highly important for a plant to have an accounting system that can provide information on the cost of maintaining individual pieces of process equipment. Another requirement, once the decision has been made to adopt a particular maintenance program, is to take a firm stand to obtain the cooperation and best efforts of everyone involved and insure teamwork.

Many accounting systems have been set up on a product basis in such a manner that the cost of maintaining individual items of equipment is hidden. In one survey over 100 different companies were contacted and asked if they had information on the cost of maintaining individual pieces of equipment. Only

**New  
Cartridge-  
Unit  
De-ionizers**

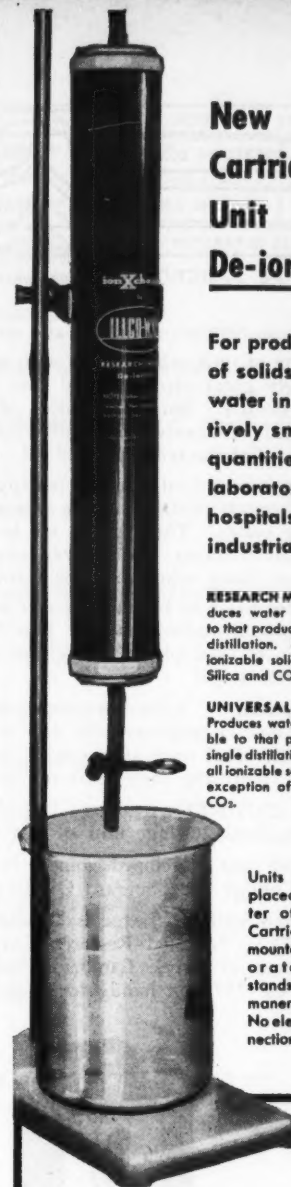
For production of solids-free water in relatively small quantities in laboratories, hospitals, industrial plants.

**RESEARCH MODEL**—Produces water comparable to that produced by triple distillation. Removes all ionizable solids, including Silica and CO<sub>2</sub>.

**UNIVERSAL MODEL**—Produces water comparable to that produced by single distillation. Removes all ionizable solids with the exception of Silica and CO<sub>2</sub>.

Flow rate: 5 gph

Units easily replaced in a matter of seconds. Cartridge can be mounted on laboratory test stands, or in permanent bracket. No electrical connections required.



• **ILICO-WAY CARTRIDGE**  
**UNITS** embody the Mixed-Bed ionXchange principle developed by Illco-Way. More than 500,000 similar Illco-Way units have been manufactured and are in use... Write for Bulletin CA-254. Illinois Water Treatment Co., 903-4 Cedar St., Rockford, Illinois.



When inquiring check CP 7577 on handy form, pgs. 2-3

CHEMICAL PROCESSING

# "SERV-RITE" THERMOCOUPLE HEAD



the head that's ahead  
in every way . . .

This new "Serv-Rite" thermocouple head is actually small enough to be held comfortably in the palm of your hand. But size is only one of the many features that make this thermocouple head really extraordinary. It is loaded with installation and service conveniences that any user of thermocouples will appreciate at once.

The body is of malleable iron, cadmium plated for durability. A new type friction lock assures easy removal or tightening of the cap—a quarter turn does it. An asbestos gasket makes the head dirt- and moisture-proof. With a choice of 1/2", 3/4", or 1" IPS opening for the protecting tube, you can standardize on one style head.

The connector block is of a material especially selected to withstand, without damage, temperatures up to 900° F. in continuous service. Improvements over the conventional type of inserts greatly simplify the making of the lead wire connections. The complete thermocouple element, including connector block, can be easily withdrawn for inspection.

Install a "Serv-Rite" thermocouple head and see for yourself how much better it really is.

Write for complete details

4421

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Manufacturers • Engineers • Distributors

Thermocouples & Accessories • Temperature Control  
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Dept. 19, 2035 Hamilton Ave., Cleveland 14, Ohio

When inquiring check CP 7578  
on handy form, pgs. 2-3

## IDEAS

six had such data available. These six reported that this cost data enabled them to effect savings in maintenance far above the expense of accumulating the information. It is virtually impossible to effect a successful cost reduction program unless such data are on hand.

The second obstacle to overcome in launching a successful maintenance program, after necessary cost data are available, is the "prima donna" attitude that may be encountered in maintenance supervision itself. On the other hand, advantage should be taken of the initiative and independent thinking of these men who are highly developed in these ways.

A firm attitude should be taken by management to obtain the cooperation of all concerned in the maintenance program. This will "head off" independent moves in many and varied directions and insure teamwork. Program must be on a high enough level to capitalize on the intelligence and native ability of the maintenance group. It will be found that there is plenty of room for initiative, independent thinking, and action within the framework of a planned maintenance program. In this way, the plant will use and benefit from the very qualities that make maintenance personnel what they are.

Often it is just such a planned maintenance program that enables a company to successfully meet competition and make a profit while others are scarcely able to break even. Planned maintenance is just as essential to any company's health as intelligent research, sales, or operations.

(Prepared from article, "Some Obstacles Commonly Encountered in the Road to Better Maintenance," by J. D. Leonard, Consulting Chemical Engineer, R. S. Aries & Associates, 400 Madison Ave., New York 17, N. Y.)

### Cooperative research project studies synergism of insecticides . . .

piperonyl butoxide/pyrethrum interaction followed by C<sup>14</sup> tag at Iowa State

In joint research project, biological behavior of piperonyl butoxide is being investigated using C<sup>14</sup>-tag. Also being used are radioactive pyrethrins. The latter were prepared at the research laboratories of the Gulf Oil Corporation where pyrethrum flowers were grown in an atmosphere containing radioactive carbon dioxide. To date, however, no announcement of results has been made.

Piperonyl butoxide has been long recognized as a synergist for increasing the effectiveness and economy of pyrethrum-type insecticides. The mixture exhibits:

- 1) Interaction at all ratios,
- 2) Effectiveness against almost all insects, and
- 3) Increase in killing power and knockdown rate of pyrethrins.

(Project is jointly sponsored by Iowa State College, Ames, Iowa, and U. S. Industrial Chemicals Co., Dept. CP, 120 Broadway, New York 5, N. Y.)

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### Save Hundreds of Dollars . . .

✓ You save production time by venting air out of steam consuming units 8 times faster than possible with ordinary inverted bucket traps.

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✓ Bellows orifice does not contract continually, like in thermostatic trap, but remains closed until it cools off. This means long bellows life.

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✓ Purges air all at once so that unvented air cannot mix with steam entering steam compartment, thereby reducing the temperature and acting as heat insulator.

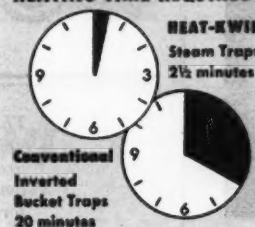
### Use Smaller Traps . . .

✓ Only necessary to use a 1 1/2 trap factor in most instances, never more than 2. This means smaller sized traps can be used.



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When inquiring check CP 7579 on handy form, pgs. 2-3



**Source of organic peroxides found in gum turpentine...**

shows promise as commercially feasible catalyst for polymerization reactions

Development of a feasible process for the production of pinane hydroperoxide from gum turpentine has been announced. This organic peroxide shows special promise as a polymerization catalyst for plastics and synthetic rubber. The pure compound has been identified as cis-1-pinane 2-hydroperoxide.

Four main steps are involved in its production: 1) hydrogenation of gum turpentine to give pinane, 2) distillation purification, 3) oxidation with molecular oxygen to a peroxide content of about 50%, and 4) vacuum stripping to yield pinane hydroperoxide as residue. Good yields and 80-90% purity are reported.

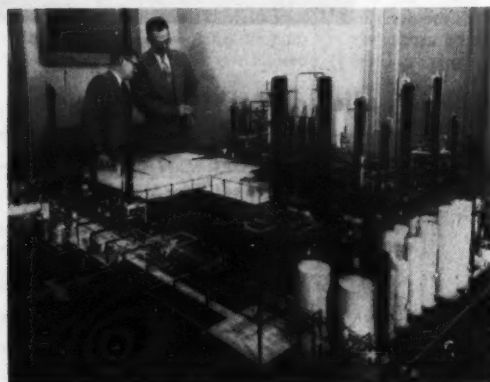
(Process was developed at the Naval Stores Station, USDA, Olustee, Florida.)

**Useful construction tool — plant scale models...**

serve many purposes, save time and money

Use of scale models in industrial construction is on the increase. Models can show every detail of plant equipment, buildings, piping, and traffic loading-unloading facilities required. They can serve at least four purposes: show company executives what finished plant will comprise, from an operational standpoint; help engineers in construction planning, as a guide to faster, more efficient work, and in planning future expansion and plant additions; train supervisory personnel for plant operation, long before plant is ready; save time and money by making possible changes in plans before costly construction is completed.

Hercules Powder Company is using such a model for its \$8 million Higgins oxychemicals plant being erected at Gibbstown, New Jersey. Plant will produce acetone and phenol. Model covers table-top space 8 by 12 ft and costs about \$15,000.

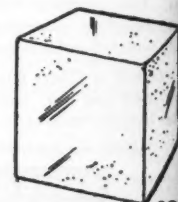
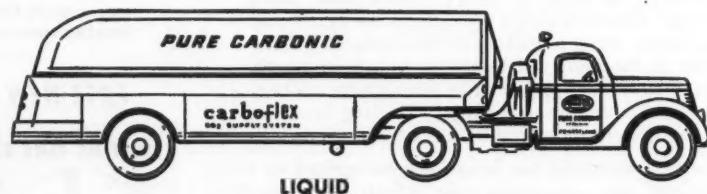


Scale models can be used by engineers as a guide to faster, more efficient work

# the magic of CO<sub>2</sub> in



A daily delivery of "DRY-ICE" is made at Lilly's by a Pure Carbonic Company driver.



In addition to the more well known chemicals and vitamins one expects to find in the pharmaceutical industry, there are some little-discussed but important materials which are used in the production of medicinals. One of these is "DRY-ICE", the name by which everyone commonly refers to solidified carbon dioxide.

Carbon dioxide is versatile. It may be used as a liquid, a solid, or a gas—Eli Lilly and Company, Indianapolis, uses it in all three ways. In its solidified form, as "DRY-ICE", it has a temperature of -109°F and is put to wide use in quick-freezing and in achieving very low temperatures inexpensively. In its gaseous form it is used to purge air, for it is the antithesis of oxygen. As a liquid it lends itself to quantity production techniques in industrial applications.

Numerous industries rely upon the high purity and dependability of Pureco CO<sub>2</sub>—as an inert, as a mild acid, as a shrinking and cooling agent, as a refrigerant—to mention a few. While Lilly does ship some vaccines under "DRY-ICE" refrigeration, here are several other ways in which the company uses some sixty-five hundred pounds of "DRY-ICE" every week. Here is what was found in following the "DRY-ICE" man around Eli Lilly and Company.

The uses of CO<sub>2</sub> shown in these pages are but a few of many. The magic of CO<sub>2</sub> is demonstrated daily in diverse industrial applications — meat packing, carbonation, rubber tumbling, chemical processing, low temperature testing and as a precipitating agent. Pure Carbonic Company is a leader in CO<sub>2</sub> development. If you have a problem involving the use of CO<sub>2</sub> look to "Pureco" for the solution. Inquiries welcomed.

# O<sub>2</sub> in pharmaceuticals . . .



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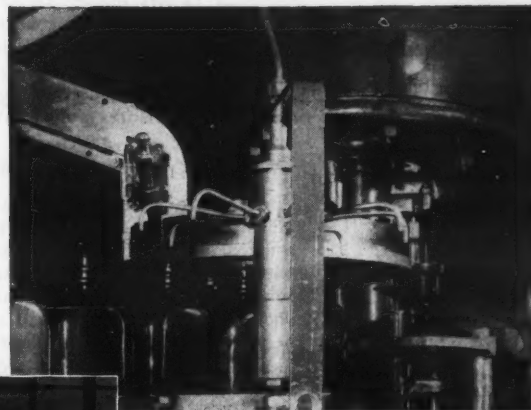
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Eli Lilly



Suppositories in liquid form are poured into molds which are then placed in a "DRY-ICE" freezing cabinet, which maintains sub-zero temperatures not economically feasible with mechanical refrigeration.

For production control, gelseals are frozen solid with "DRY-ICE" and then sliced open. The seam can then be measured down to a one-thousandth of an inch.



Technicians of Lilly's call this process "blanketing" Homicebrin (Homogenized Multiple Vitamins, Lilly). A squirt of gaseous CO<sub>2</sub> chases oxygen out of the bottle. This CO<sub>2</sub> gas is generated from "DRY-ICE" by a conveniently located converter.

An important step in preserving the essential alkaloids in ergot is achieved by mixing marble-size chunks of "DRY-ICE" with ergot before feeding it into a mill to be ground.

"DRY-ICE" in the research area is used to quick-freeze viruses. By being frozen in the liquid state, the virus may be stored alive.



**PURECO**

**Pure Carbonic Company**

GENERAL OFFICES: 60 EAST 42ND STREET, NEW YORK 17, NEW YORK

A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

When inquiring check CP 7580 on handy form, pgs. 2-3

IDEAS

Built one-quarter inch to scale, various colors designate which pipelines carry water, steam, and chemicals. Facilities not shown in model include power house, shop, laboratory, change house, and main office building.

(Information courtesy of Hercules Powder Company. Plant models are built by Industrial Models, Inc., Dept. CP, 2311 Sconset Rd., Wilmington 3, Delaware.)

## Floating seal of plastic bubbles reduces oil storage tank evaporation losses . . .

phenolic resin balloons have 0.002-0.0036" diam

Tiny hollow bubbles of Bakelite phenolic resin floating in a thin layer on top of crude oil can cut evaporation losses from storage tanks by an average of 83%. Resembling particles of finely ground dark flour, the Microballoons, as they have been trademarked, look like brown ping-pong balls under a microscope. Bubbles vary from 0.002 to 0.0036 inches in diameter, contain nitrogen.

Developed by Standard Oil Company of Ohio, they have been on field test for more than a year. Balloons are put into tanks by pumping them in with the crude until a layer 1/2 to one inch in thickness has been formed.

(Microballoons are a product of Bakelite Company, a Division of Union Carbide and Carbon Corp., 260 Madison Ave., New York 16, N. Y. . . or for more information check CP 7581, pages 2 and 3.)

## High chemical immunity reported for clear plastic sheet . . .

insoluble in known solvents, hydrofluoric acid

High optical and mechanical properties are claimed for recently-developed thermosetting plastic sheet material. Product is clear, transparent, and said to be scratch- and abrasion-resistant.

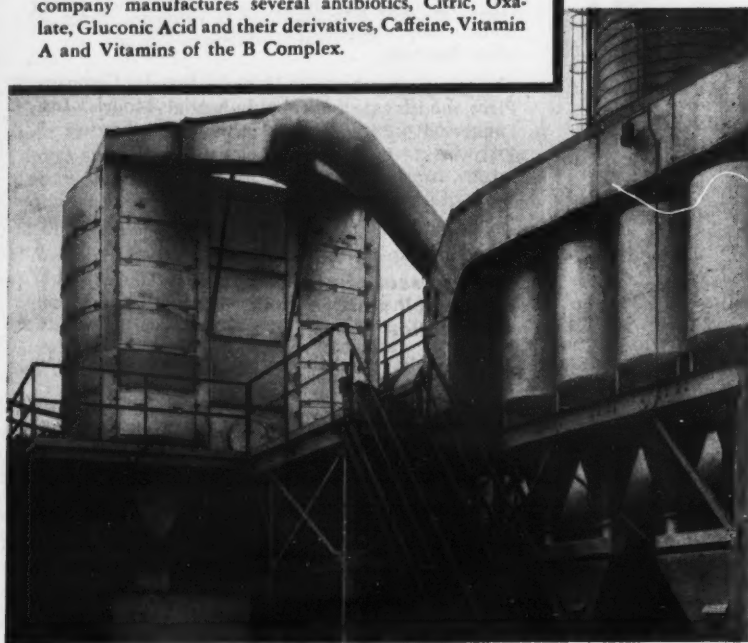
Surface characteristics compare in smoothness and lustre to polished plate glass, with a high degree of chemical immunity and resilience that affords protection to laboratory glassware. It is reported to be insoluble in all known solvents and hydrofluoric acid. Product will not melt or yield when subjected to moderately high temperatures, and is readily machined by almost any method. Hot flying sparks or pieces of metal will not cause cracking or pitting.

Recommended applications include fabricated chemical exhaust hoods, protective barriers where safety and visibility are factors, laboratory work tables, and instrument windows.

(Homalite CR-39 is product of The Homalite Corporation, Dept. CP, 14 Brookside Drive, Wilmington 166, Delaware . . . or for more information check CP 7582 on handy form, pages 2 and 3.)



Photo shows two of the eight DAY Reverse Jet Dust Filters used by Chas. Pfizer & Co., Inc. These dust filters are located at the Groton, Connecticut plant where the company manufactures several antibiotics, Citric, Oxalate, Gluconic Acid and their derivatives, Caffeine, Vitamin A and Vitamins of the B Complex.



## WHY CHEMICAL PLANTS USE DAY REVERSE JET DUST FILTERS

1. Reverse Jet Cleaning permits the use of more efficient filter media which gives filtering efficiencies up to 99.99+%.
2. Constant air volumes maintained because of continuous cleaning action.
3. Continuous, automatic operation without the necessity of shutting down any section for cleaning.
4. Air-to-cloth ratios to as high as 20 to 1, depending on dust being handled.

If you want to recover product or dispose of dust our Bulletin Number 528 contains new information on dust control. Write ToDAY for this Bulletin.

**The DAY Company**

852 Third Ave. N.E., Minneapolis 13, Minn.

IN CANADA: P.O. Box 70Y, Ft. William, Ontario • Branch Plant: Buffalo, Fort Worth, Welland, Ontario



When inquiring check CP 7583 on handy form, pgs. 2-3

## IDEAS

### Effectiveness of anion exchange resins influenced by many factors . . .

operating and regenerating conditions important to get best use from polystyrene-base resins

Important factors influencing effectiveness of polystyrene-base anion exchange resins (U S Patent No. 2,591,573) are given below. Weakly basic resins are made by introducing polyamines into a styrene polymer structure, strongly basic resins from introducing exchange groups having higher basicity.

#### Pretreatment

Anion exchange bed should not be used as a filter. Influent should be clear and all organic contaminants removed. If chlorination or oxidation methods are insufficient to remove these organics, a porous anion exchanger can be used. Residual organic matter in concentrations of 2-5 ppm can reduce resin capacity for treating water after a short time of operation. These complex organics resist regenerating. Problem is still under investigation.

#### Operation

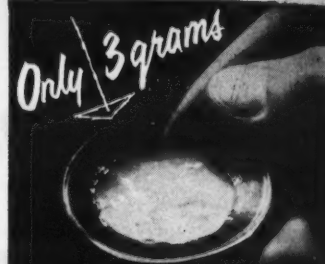
- 1) High operating temperatures reduce stability of resins. Maximum working temp for weakly basic resins is 212°F; for strongly basic, 105°F; for very strongly basic, 140°F.
- 2) Recommended optimum exchange rate of weakly basic resins is slower than strongly basic. For example, with a minimum bed depth of 24", weakly basic resins have rate of 5 gal/ft<sup>2</sup>/min; strongly basic, 10.
- 3) Pressure drop through bed is affected by operating temp and flow rate. It varies inversely with temp, directly with flow rate.
- 4) Weakly basic resins remove strongly ionized acids, but are ineffective for weak. They can take a temporary surge of CO<sub>2</sub>, however. Strongly basic resins remove both strong and weak acids, but for more economical operation, CO<sub>2</sub> should be degassed from influent.
- 5) Special procedures have been developed to determine silica leakage in effluent from strongly basic resins, since these resins can reduce silica to concentrations of 5 parts per billion.
- 6) Problems with oxidation or reduction reagents and acid shock are not encountered with these resins.

#### Backwash

- 1) Thorough backwash of resin bed is necessary for cleansing and reclassification of particles.
- 2) Backwash water temp is important. Variations in temp may necessitate flow rate adjustment.

#### Regeneration

- 1) Weakly basic resins require caustic or ammonia regenerants is alkali equivalent of 110-115% theoretical acid removal capacity. When soda ash is used, 130% is required. Strongly basic resins require high grade caustic regenerant, as a 1-2% chloride



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**ANTIFOAM A**  
KILLS FOAM IN

**10 TONS**  
of asphalt or  
10 tons of alkyd resin

**2630 lbs.**  
of fermenting wine

**1474 lbs.**  
of soap tallow

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of metallic soaps

Save space now wasted on foam; cut processing time; eliminate waste and fire hazard of overflowing foam.

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New water dispersible emulsion of Antifoam A is equally versatile, equally effective in the industrial processing of aqueous foamers.

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When inquiring check CP 7584 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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APRIL

contamination can reduce resin capacity 15-20%.

2) Increased contact time and higher temp improve regeneration. Regenerant flow rate of 1/gal/ft<sup>3</sup>/min is recommended.

3) Complete regeneration is important to avoid acid leakage due to hydrolysis or regeneration effect of water itself.

4) With strongly basic resins, influent ratio of silica to total anion concentration greater than 0.2 in raw water, required prolonged contact with 95°F regenerant.

5) Silica may present problem with strongly basic resins. Contact time and temp of regenerant are critical. Aging of silica in resins increases difficulty of removal. Acid leaching also complicates problem. Treating with excess caustic solution at 105°F for a prolonged period will dissolve silica.

#### Rinse

1) Starting rinse rate should be same as regenerant; then rate should be increased.

2) Necessary quantity of rinse water depends on type and amount of regenerant. Rinse volume of strongly basic resins should be determined by titration of effluent. As these resins split neutral salts, the residual causticity of the rinse water from the unit cannot be lower than the concentration of Ca, Mg, and Na cations in the influent.

(Information obtained from technical paper, "Factors influencing the Operation of Anion Exchange Resins," by J. Thompson and F. X McGarvey, of Rohm and Haas Co., Dept. CP, Washington, Philadelphia 5, Pa.)

#### British salvage team reports on metal in US industry

Report by British salvage team visiting US industrial establishments has been released by US Department of Commerce. With steel as basic study, team investigated US industry's success in conserving scarce alloying metals like nickel, chromium, manganese, molybdenum, tungsten.

Report consists of 33 pages and covers ferrous, non-ferrous, light metal alloys, rare metals, and scarce alloying materials. It examines values of emergency specifications and standards, and effects of changes in alloy content of numerous metals. American management's success in certain economy measures like scrap reduction, remedial treatments of rejected workpieces, changes and simplifications in standard designs, and other efforts, are presented.

Figures cite reductions in use of scarce alloying elements. Report concludes by discussing controversial points and how other metallurgists can profit by US industry's experience.

To obtain report PB 106425, "Saving Scarce Materials," remit 50¢ to Office of Technical Services, US Dept. of Commerce, Washington 25, D. C.

# SYNCHRONIZED Automatic System FOR CONTINUOUS PREPARATION OF FILTER AID SLURRY

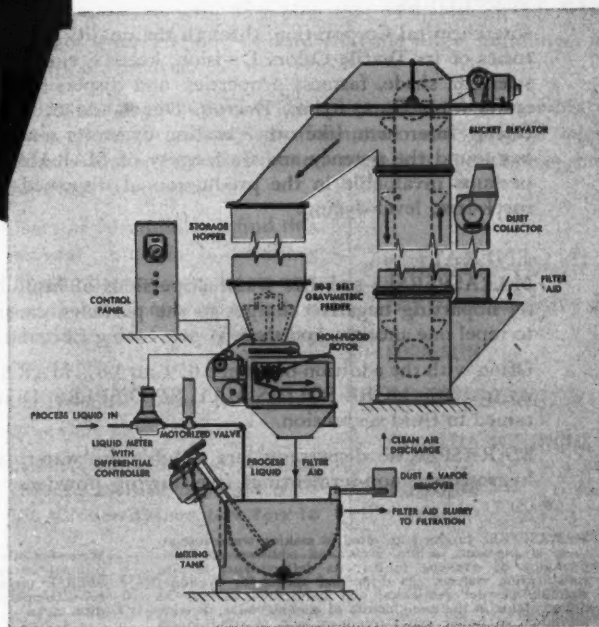


Filtration — an increasingly important operation in the food, petroleum, pharmaceutical, and chemical industries — is put on a mechanized basis with this "packaged" system for preparing filter aid slurry . . . one of the many Omega Feeding and Proportioning Systems available to industry today.

This system feeds finely pulverized filter aid (weighing 7 to 15 lbs. per cu. ft.) in step with the flow of process liquid to the filters. A sensitive synchronizing unit maintains the pre-selected ratio of dry material to liquid . . . keeps slurry concentration at the optimum level . . . eliminates hit-or-miss, high-cost manual preparation. It's an Omega System throughout — from the Model 50-8 Belt Gravimetric Feeder (accurate within  $\pm 1\%$  by weight) to the mixing tank, dust and vapor removal devices, synchronizing mechanism, and control panel. The design and construction of this "packaged" system is 100% an Omega responsibility which relieves the customer of the purchasing and engineering of individual components.

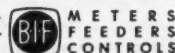
Omega Dry and Liquid Feeders fit into the widest range of continuous processing and blending operations. Tell us about your problems and we will gladly submit recommendations and quotations. Omega Machine Company (Division of B-I-F Industries, Inc.), 387D Harris Ave., Providence 1, Rhode Island.

Continuous slurry preparation system including Omega 50-8 Belt Gravimetric Feeder with positive, non-flood feeding mechanism; mixing tank and agitators; dust collector, bucket elevator, storage hopper; control panel and differential controller.



## OMEGA THE LAST WORD IN FEEDERS

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When inquiring check CP 7585 on handy form, pgs. 2-3



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USE  
**MARASPERSES**  
THE *low-cost,*  
HIGHLY EFFECTIVE DISPERSANTS



Chemist checking dyestuff quality in a control lab at Interchem Textile Colors Division.



#### IN DYESTUFFS:

Interchemical Corporation, through the quality control laboratories of its Textile Colors Division, keeps a close watch over strength, shade, fastness properties, and dispersibility of dyestuffs for acetate, nylon, Dacron, Dynel and other synthetic fibers. Interchem, like other leading dyestuffs manufacturers, has found the potency and uniformity of MARASPERSE dispersants invaluable in the production of dispersed colors for speck-free, level dyeing.

#### IN GENERAL:

MARASPERSES stabilize water dispersions of insoluble solids by imparting negative charges to the particles, causing them to repel one another, and thereby preventing flocculation.

Often with the addition of from 0.05% to 3.0% MARASPERSE, up to 300% MORE SOLIDS MAY BE DISPERSED and maintained in fluid suspension.

MARASPERSE dispersants are soluble in water; are non-hygroscopic, non-fermenting, free-flowing powders.

MARASPERSE products are used in making water-suspensions of pigments, sulfur, clays, and additives for compounding of synthetic rubber. As deflocculants in size classification systems. As dispersing agents for dyestuffs, wearable powder pesticides, and industrial cleaners. As deflocculants in the manufacture of ceramic ware, as scale inhibitors in boiler water treatment and as conditioners for oil well drilling fluids.

Write for File No. A-212 for additional information on MARASPERSE products. You will receive complete and specific technical data.

**MARATHON Corporation**  
CHEMICAL DIVISION  
ROTHSCHILD • WISCONSIN

When inquiring check CP 7586 on handy form, pgs. 2-3

#### IDEAS

##### Sodium hydride descales hot-rolled titanium . . .

operates at 700°F, is odorless and fumeless

Pure titanium, in sheets up to 1" thick and as thin as 0.015", is being descaled successfully at the Universal-Cyclops Steel Corp., Bridgeville, Pa.

In the process, titanium sheets are immersed for 15 min in a 1.5-2% bath of sodium hydride dissolved in NaOH. Temperatures are kept at 680-700°F. There are no problems of burning or hydrogen embrittlement.

Sheets are then transferred to a water quench to remove descaling bath residue. Next comes a dual acid wash: first, in 8% H<sub>2</sub>SO<sub>4</sub> @ 100°F for one min; then the second — 1% HF and 6% HNO<sub>3</sub> at room temp for 1/2 min. A final water rinse completes treatment. Descaling is odorless and fumeless.

(Additional information on descaling process may be obtained from Ethyl Corporation, Dept. CP, 100 Park Ave., New York 17, N. Y. . . or check CP 7587 on handy form, pages 2 and 3.)

##### Refinery waste stream pollution prevented by bacterial oxidation system . . .

phenol and other organic waste materials are effectively removed

Reported to be the first oil refinery installation of its kind, Sun Oil Company Limited's Sarnia plant is removing phenol and other organic waste material by using a bacterial oxidation water purification system. The process, which has been proved successful in operation by other industries and large cities, protects the St. Clair river from pollution.

System owes its effectiveness to activity of bacterial growths (Achromobacter in case of phenolic wastes) which form voluminous living clumps or flocs in oxidation basins. Organisms in contact with organic waste, water, oxygen, and nitrogen, exude extra- and intra-cellular enzymes, which chemically break down organic food source into simpler inorganic usable compounds. Carbon and nitrogen convert into protein protoplasm and bacterial cells divide. In phenolic wastes, oxidation of one lb of phenol requires a little over two lb of oxygen. Chemical end products are carbon dioxide and water. Bacterial flocs continue to grow and multiply and adsorb additional suspended waste matter on their surfaces. Process is self-limiting, depending on quantity of "food supply" (waste materials), speed at which oxygen can be absorbed, temperature, and pH. As organisms in floc die, they contribute to waste material to be oxidized and new organisms take their place.

Plant description is briefly as follows. (Three separate systems for preliminary segregation and treatment of different types of waste water, are used. This is necessary for an economical installation of the process.) Waste water from a proc-



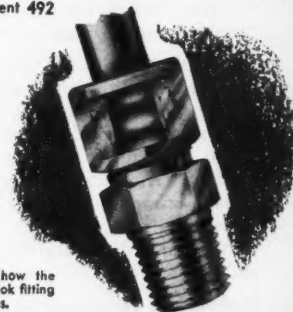
#### HOKE VALVES WITH

**Swagelok®**

#### ENDS

Now they are available from stock at Crawford Fitting Company and all Swagelok Distributors. These valves, manufactured by Hoke, Incorporated, Englewood, N. J., are equipped with Swagelok ends to provide leakproof and torque-free seals on every type of instrumentation installation. The arrow on the valve body shows direction of flow.

Hoke valves equipped with Swagelok ends are made in brass, aluminum, steel and stainless steel in sizes to meet your requirements. For further information and Swagelok catalog address Department 492



Here's how the Swagelok fitting functions.

#### CRAWFORD FITTING CO.

884 East 140th Street, Cleveland 10, Ohio  
Telephone CV 785

When inquiring check CP 7588 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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APRI

ess separator (which removes any free oil present) is mixed with a stream of purified water. Diluted waste water is then pumped to large oxidation pit, 90 ft long, 70 ft wide, and 12 ft deep.

Stream enters from bottom of pit through network of 40 eductor jets which aerate water by adding minute particles of air, and eject it in a fine spray. Eductors perform two important functions. They keep water circulating in oxidation pit with activated sludge and add necessary oxygen to water to sustain bacteria.

After circulating in oxidation pit for six to eight hours, treated water is drawn off through overflow line at top of 10-ft water level. It then flows to another separator which collects the bacterial sludge present for clarification of the effluent. Sludge is drawn off and pumped back to oxidation pit, ready to go to work again.

(Information courtesy of Sun Oil Company, Dept. CP, 1608 Walnut St., Philadelphia 3, Pa.)

#### Adhesive gives strong bond between copper and plastic in printed circuits . . .

bond strengths up to 35 pounds/in obtained by precoating adhesive on copper sheets

High bond strength between copper and thermosetting plastics is obtained from product, an adhesive precoated on thin electrolytic copper sheets. Developed for use in printed circuits for radio and electronic components, product has reduced time and operations required to make copper/plastic laminates.

Called "Plymaster," product is available in two basic formulations. Type "N" is for use with phenolic resins, and will pass 200°C solder dip test; and type "E" for silicone base laminates. Type "E" will also pass 235°C solder dip test.

(Precoated adhesive is a product of Dept. P, Rubber and Asbestos Corp., Dept. CP, 225 Belleville Ave., Bloomfield, N. J. . . or for more information check CP 7589 on handy form, pages 2 and 3.)

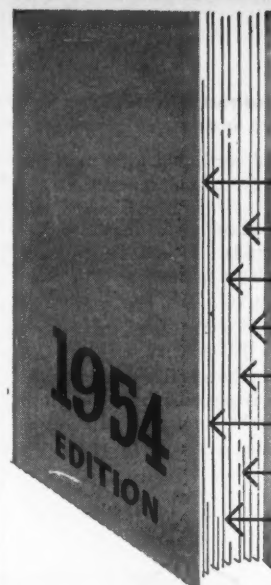
#### Corrosion-resistant, shatter proof sight glasses made of plastic . . .

temperature range is from -65 to 300°F

Suggested for use in chemical, drug, and food processing industries as material for sight glasses. Plastic has high compressive strength and resiliency, will not crack or shatter in operation, and will retain its transparency indefinitely.

Sight glasses are machined from sheets having thicknesses up to 1/4". Plastic material is polytrifluoromonoethylenes.

(Kel-F plastic is a product of Chemical Manufacturing Div., The M. W. Kellogg Co., Dept. CP, P. O. Box 469, Jersey City 3, N. J. . . or for more information check CP 7590, pages 2 and 3.)



UNLOADING  
STORING  
TEMPERATURE EFFECTS  
SAFETY PRECAUTIONS  
TANKCAR CONSTRUCTION  
METHODS OF ANALYSIS  
FIRST AID  
SPECIFICATIONS, PROPERTIES

# CELANESE\* FORMALIN MANUAL

Your non-technical personnel will find the Celanese Formalin Manual clear, concise, and easy-to-follow. Based on years of field experience with Formalin, this 1954 Edition has been brought completely up-to-date with the latest handling and storing procedures.

For technical personnel, it describes effects of temperature, basic reactions causing paraformation, and general information concerning construction materials for storage and handling equipment.

Users of Formalin will find this manual valuable in bridging the gap between engineers and non-technical operators. It is a must for plant safety training programs.

Use coupon below to reserve your copy now.

Celanese Corporation of America  
Chemical Division, Dept. 591-D  
180 Madison Avenue, New York 16

Celanese—basic  
for Formaldehyde  
FORMALIN  
PARAFORMALDEHYDE  
FORMCEL\* SOLUTIONS  
TRIOXANE

order your copy now!



\*Reg. U. S. Pat. Off.

INTERMEDIATES—SOLVENTS—PLASTICIZERS

CELANESE CORPORATION OF AMERICA  
CHEMICAL DIVISION, DEPT. 591-D  
180 MADISON AVENUE, NEW YORK 16, N. Y.

Reserve my free copy of the Celanese Formalin Handling Manual.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 7591 on handy form, pgs. 2-3



# SOLVE YOUR MIXING PROBLEMS



A tremendous variety of fluid mixing needs are ably handled by the complete line of Eastern Mixers. Size and power of mixers are flexible to help solve your problems. For complete information and engineering data, write for Eastern Fluid Mixing Catalogs. Eastern engineers are always available to work out your complex mixing problems with you.



## Eastern INDUSTRIES, INC.

Dept. D, Regent St., Norwalk, Conn.

When inquiring check CP 7592 on handy form, pgs. 2-3

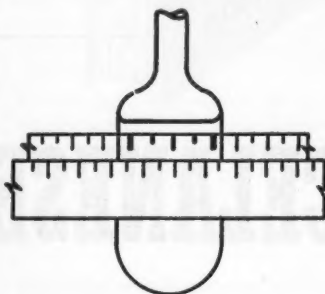
## IDEAS

### Quick method estimates refractive index . . .

useful for liquids that must be kept from contact with air

Simple method gives refractive index of liquids. Estimation to three decimal places is possible with calibration curve. All that's needed is a thin-walled, cylindrical glass tube, and two graduated scales.

The glass tube is filled with liquid. One scale is placed behind, tangent, and at right angles to the tube. Other scale is placed in front, as



illustrated. Apparent length of a convenient central portion of the back scale, as magnified, is read on the front scale. Calibration curve relates apparent length to refractive index.

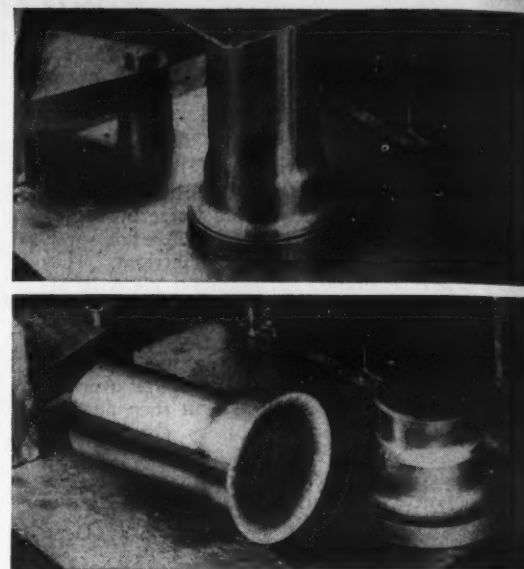
Liquids of known refractive index are used to make the calibration curve. Temp does not have to be controlled, in view of the limited accuracy. Method is especially useful for liquids that must be kept out of contact with air.

(Idea of Somers H. Smith, Jr., Naval Research Laboratory, Washington, D. C., digested from *Chemist-Analyst*, Vol 42 (December, 1953); courtesy of J. T. Baker Chemical Co., Dept. CP, Phillipsburg, N. J.)

### Fluorspar plant described in bulletin

Large 325 ton acid grade fluorspar plant is described in bulletin. Geological information about fluorspar deposits, photographs, plant flowsheet, and data are included.

Bul M4-B69 is issued by Denver Equipment Company, Dept. CP, Box 5268, Denver 17, Colorado. Specify CP 7593, pages 2 & 3.



## Pressure tube users benefit from **REPUBLIC** tests

This flanging test, performed prior to normalizing, isn't listed in A.S.T.M. A-214 specifications. But Republic Tubing passes it anyway, just as extra insurance that you'll get maximum service from ELECTRUNITE Carbon Steel Heat Exchanger Tubes. Afterward, every foot of every length of ELECTRUNITE is fully normalized.

ELECTRUNITE Heat Exchanger and Condenser Tubing also passes all tests listed in A.S.T.M. A-214. They include the hydrostatic or non-destructive electric test, flattening, reverse flattening and hardness tests.

The results pay off in dependable service. It is another reason why ELECTRUNITE Tubing has such a good performance record for over twenty years throughout the process industries. For more facts about Republic ELECTRUNITE Pressure Tubing, write for booklet BT-54.

### REPUBLIC STEEL CORPORATION Steel and Tubes Division

206 East 131st Street, Cleveland 8, Ohio  
GENERAL OFFICES • CLEVELAND 1, OHIO  
Export Department: Chrysler Building, New York 17, N.Y.



When inquiring check CP 7594 on handy form, pgs. 2-3

CHEMICAL PROCESSING



**Celanese**  
CORPORATION OF AMERICA



ALL  
THESE  
FIRMS  
CHOSE  
The  
**Cowles  
DISSOLVER**

... because it dissolves and disperses 2 to 20 times faster — and in the same space ordinary mixers require! The secret: the Cowles impeller which operates at velocities up to 7,500 f.p.m.

The Cowles Dissolver saves not only time and labor, it improves your product and yield per batch as well. It's rugged, fast-loading, easy to maintain, performs tasks other mixers cannot.

**GET  
THE FACTS**

... on the Cowles Dissolver — send for a catalog today! And ask to have a detailed test run on your materials.

**The Cowles Company**  
INCORPORATED

**THE COWLES COMPANY, INC.**

113 Trackside, Cayuga, N.Y.

Gentlemen: Please send me your latest Cowles Dissolver catalog.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY AND STATE \_\_\_\_\_

When inquiring check CP 7595 on handy form, pgs. 2-3

## IDEAS

### Mold release agent for plastics comes in aerosol package ...

crystal clear, it will never discolor products

Packaged in aerosol can, mold release agent is readily applied. It can be used with urea, phenolic, melamine, polyester, and epoxy resins for compression and lay-up molding, laminating, and casting. Agent dries almost instantly. It is crystal clear and will not discolor any types or colors of plastics. No oily film or burnt areas are left on product surfaces. There is no effect on paintability or cementability of products.

(Type R-2 mold release is a product of Vin-Rock, Inc., Dept. CP, 8211 Almira Ave., Cleveland, Ohio ... check CP 7596 on handy form, pages 2 & 3.)

### Quick and easy access to pipes given by separately supported ceiling panels ...

ceiling "laid on" 3 x 3' hollow squares formed by supporting and cross tees

Incombustible ceiling board faced with plastic film is used to absorb noise of manufacturing operation at large pen factory. Plastic film acts as drumhead and distributes noise which is carried into the Fiberglas boards where it is trapped by millions of air cells formed by maze of fibers of glass.



Allows easy access to piping

Aluminum supporting tee-bars, each 15 feet in length are spliced together to run length of room or area to be covered and suspended by wires from the structural work above. Aluminum cross tees were fastened to the supporting tees at 3 foot intervals. Ceiling boards were "laid on" the 3 x 3 ft hollow squares formed by supporting and cross tees.

Any board may be removed for access to area above the ceiling.

Plastic film faces of boards may be washed or wiped repeatedly without impairing their surface or acoustical value.

(Fiberglas Sonofaced ceiling board is a product of Owens-Corning Fiberglas Corp., Dept. CP, 1833 Nicholas Bldg., Toledo 1, Ohio ... or check CP 7597 on handy form, pages two and three.)

For more information on product advertised at right, specify CP 7598 ... see information request blank between pages 2 and 3.



The large stock of controlled ductile metals used in the manufacture of BS&B rupture discs enables us to duplicate a previous requirement as well as affording you a wide selection in pressure — from 5 to 50,000 lbs.

Each Kel-F lined rupture disc is given a leak detector test and must be proven pin-hole free.



## For CORROSIVE Conditions

### Equip Your SAFETY HEADS With BS&B Kel-F Lined Rupture Discs!

Whenever BS&B Safety Heads are installed in a location where corrosive conditions exist, an unprotected metal rupture disc may be vulnerable to corrosive attack from either the product or the atmospheric side—or both.

The recommended disc to use under these circumstances is the BS&B Kel-F lined rupture disc, which has for more than 3 years proven its resistance to corrosive attack from strong acids, caus-

tics, chlorine, etc. Kel-F is a trade name for a thermo-plastic film of trifluorochlorethylene, which is also known by the trade name of Trithene. Discs may be specified with the Kel-F lining on either or both sides, as your conditions may require.

The use of Kel-F linings in combination with metals of known mechanical and metallurgical qualities such as Inconel, Monel, stainless steel, and nickel means positive, trouble-free protection in highly corrosive applications heretofore impossible.

Thus, through "know-how" attained by years of experience in this highly technical field, BS&B has again provided the Process Industries with a better safety device for the protection of closed pressure systems!



For full information on the BS&B Kel-F lined rupture disc and its application to your specific problem, consult your BS&B Office or Representative ... or write to us direct.

**THE "CIRCUIT-BREAKER" OF  
Any Pressured System**

**BLACK, SIVALLS & BRYSON, INC.**

Safety Head Division, Dept. 2, M4  
7500 East 12th St., Kansas City 26, Mo.

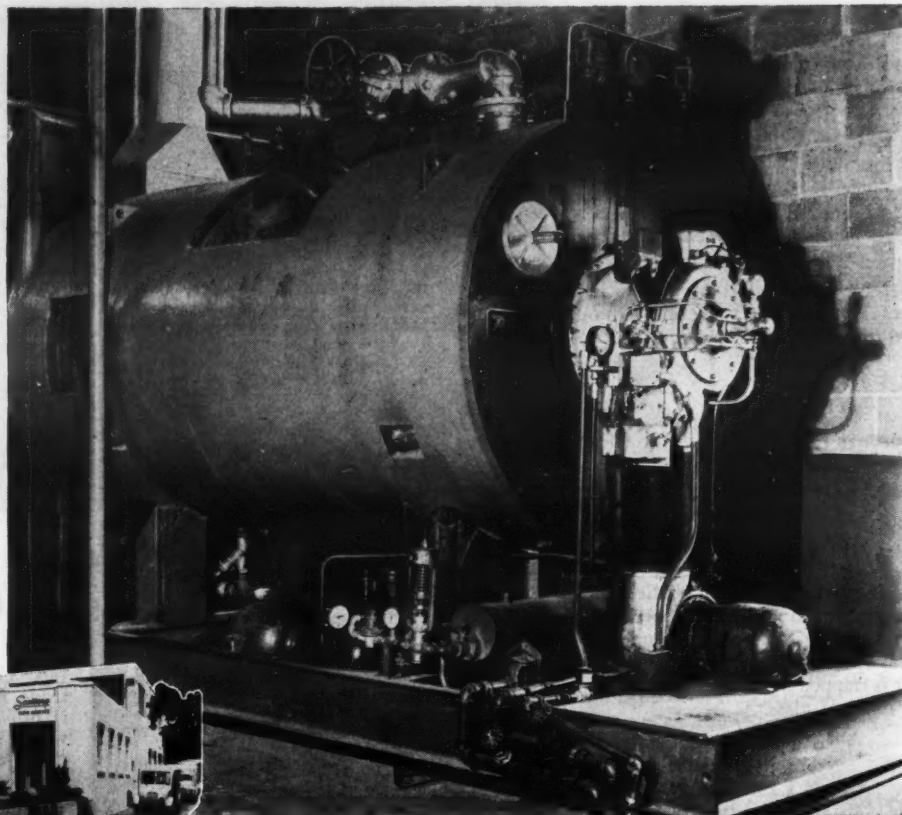




# in FOOD PROCESSING PLANTS

## COMPARABLE FUEL COSTS

	Old Boiler	Powermaster
Dec.	\$1304.16	\$543.07
Jan.	1062.29	748.79
Feb.	998.02	485.25
	\$3364.47	\$1777.11



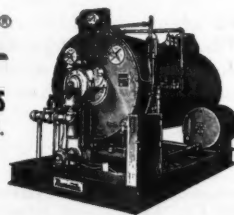
## Powermaster® Operating Efficiency Pays Off

For example: An Iowa dairy cut fuel costs over 40% by replacing its original boiler with a modern oil-fired *Powermaster* a couple of years ago. And it is supplying steam for processing 150% greater volume of dairy products as well as for heating! The new boiler enabled the dairy to change to heavy oil for greater fuel economy.

Have you taken a close look at your steam costs lately? Remember, the big pay-off on a boiler is its operating efficiency... and that's where *Powermaster* excels, as many other dairies along with bakeries, bottlers, canners, packing houses, and other food processing plants have discovered since installing *Powermasters*. But instal-

lation, space-saving compactness, fast steaming, hospital-clean operation, maintenance-saving accessibility, and fully automatic operating and safety controls are other time-saving and cost-reducing advantages *Powermaster* provides. When you're in the market for a boiler, remember—Steam costs go down where *Powermasters* go in. Better send for latest descriptive bulletin today.

**Powermaster®**  
PACKAGED AUTOMATIC BOILERS  
In sizes to 500 HP; pressures to 250 psi.



**QRR & SEMBOWER, INC.** • Established 1885 • Morgantown Road, Reading, Penna.

When inquiring check CP 7599 on handy form, pgs. 2-3

## IDEAS

### Tells scientific accomplishments of personnel during past year

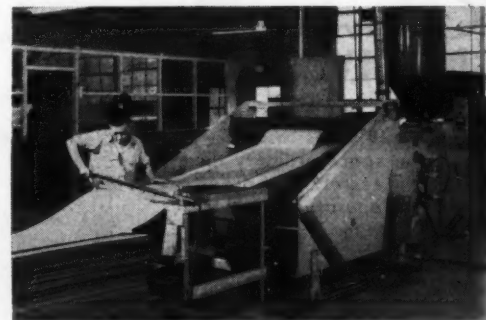
Some of the past year's scientific accomplishments by Columbia University personnel are detailed in 30-page illustrated book. The "annual" covers diverse fields of science and engineering from structure of the atomic nucleus to prescription plastics, nucleic acids, and effect of trace metals on tobacco. Natural and physical sciences are treated.

Research News Annual is available from Columbia University Engineering Center, Dept. CP, New York, New York.

### High impact strength provided by readily formed, light plastic sheet...

polystyrene-rubber copolymer is durable and economical

Rigid plastic sheet material, known as Campco S-300, has number of desirable properties such as high impact strength and light weight. Material, which is a copolymer of polystyrene and rubber, can be vacuum formed, making it easy to obtain



Rigid plastic sheet is made by extruding polystyrene and rubber copolymer

desired shape. It also machines easily. High heat distortion point, low flammability, low water absorption, and other characteristics may be noted from following table:

#### Properties of Campco S-300

Tensile strength, psi	4000-5000
Elongation, %	22-30
Impact strength, Izod notched	1.5-3.0
Sp gr	1.04-1.06
Heat distortion, °F	155-163
Flammability	low
Water absorption, % 24 hr	0.10
Yield point, psi	26,000

Material is made by heating the copolymer and extruding it through a die to desired dimensions and finish, as shown in accompanying photograph. Sheet is particularly adaptable for applications

# NOW

## INDUSTRIAL REX-FLEX

### Heavy Wall

### Stainless Steel

## HOSE

### Available in four types to meet every industrial need

TYPE RF-44—Annularly corrugated; sizes from 2 1/2" through 6" I.D. for working pressures to 40 psi.

TYPE RF-45—Same as Type RF-44, but with metal braid covering for working pressures to 410 psi.

TYPE RF-54—Helically corrugated; sizes from 1/4" through 2" I.D. for working pressures to 440 psi.

TYPE RF-55—Same as Type RF-54, but with metal braid covering for working pressures to 3100 psi.

To meet the growing demand for heavy duty stainless steel hose, Flexonics Corporation now offers new heavy wall Industrial REX-FLEX. Backed by unmatched experience in the manufacture of corrugated stainless steel, steel and bronze hose, the new Industrial REX-FLEX marks an important step forward in the development of corrosion-resistant hose that can stand the gaff of rugged industrial service, and still maintain maximum flexibility.

A complete range of flanged or screwed fittings may be used, attachment being made by silver brazing or atomic hydrogen welding.

See your industrial distributor, or write for data sheets giving full specifications on Industrial REX-FLEX.

### TYPICAL APPLICATIONS FOR INDUSTRIAL REX-FLEX

- ✓ Weigh tank connections
- ✓ Superheated steam
- ✓ Conveying corrosive gases and liquids
- ✓ High temperature connections
- ✓ Vibration connections
- ✓ Vacuum hose
- ✓ Fireproof connections
- ✓ Conduit
- ✓ Offset motions
- ✓ Continuous flexations
- ✓ Air ducts
- ✓ Exhaust connections, etc.

#### WRITE FOR CATALOG

Industrial REX-FLEX is part of Flexonics' complete line of flexible metal hose. All types are described in Catalog 130-R. Or see the Flexonics' catalogs in Sweets, Chemical Engineering Catalog or Refinery Catalog.



# Flexonics Corporation

CHICAGO METAL HOSE DIVISION  
1319 S. THIRD AVENUE • MAYWOOD, ILLINOIS

FORMERLY CHICAGO METAL HOSE CORPORATION

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Flexon identifies products of Flexonics Corporation that have served industry for over 52 years.



Flexible metal hose

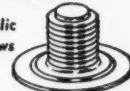


Expansion joints

Aircraft components

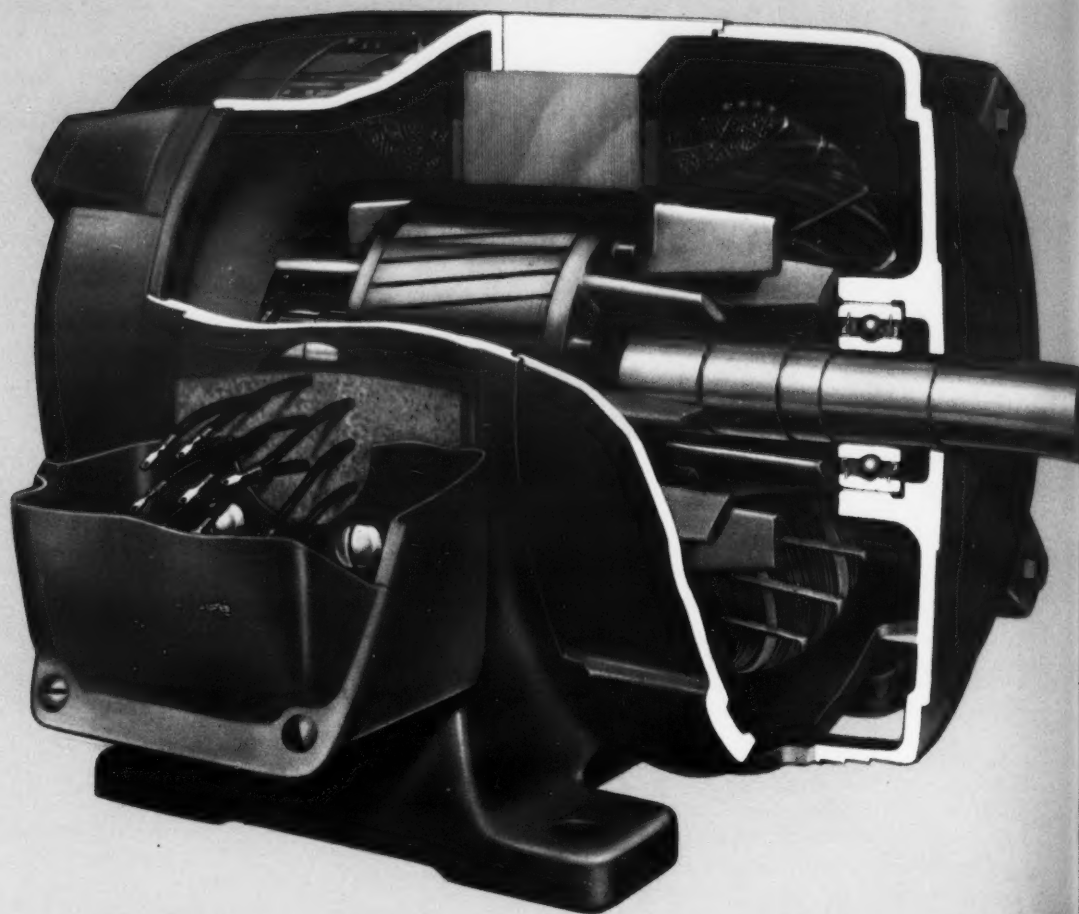


Metallic bellows



When inquiring check CP 7660 on handy form, pgs. 2-3





#### NO GREASING REQUIRED

**New 4-WAY SEAL**, pre-lubricated bearing means lower maintenance costs. Another step ahead in bearing design. A SEALED, PRE-LUBRICATED bearing with *two* protective seals on *each side*. Stationary inner seals form labyrinth joints. Rotating outer seals act as flingers. This bearing has all the advantages of the original Life-Line sealed bearing—*plus extra protection*.



**New FORTIFIED INSULATION** means longer motor life. Another step ahead in motor insulation. MYLAR\*, a new slot insulation with greater dielectric and mechanical strength. BONDAR, a new wire insulation with more heat resistance . . . longer life. BONDITE, a new stator insulation with greater strength to withstand attacks from destructive elements.

\*Trademark for DuPont polyester film



**New PROTECTED HOUSING** means drip-proof in any position. Another step ahead in motor protection. End-bracket openings are located in the under-quadrant for maximum protection. Brackets can be rotated 90° or 180° for wall or ceiling mounting. Circumference of motor frame is *completely enclosed* so that it remains drip-proof in *all* mounting positions.

# The new *Life-Line* **A** motor

## ...the big step ahead by Westinghouse

Here it is . . . the new Life-Line® "A" motor. A new motor that steps ahead to lead the industry. A new motor that reflects the continuing engineering and manufacturing leadership of Westinghouse. A new motor that gives you . . .

- Greater protection
- Greater application flexibility
- Smoother, quieter operation
- Lower maintenance costs
- Fewer motor outages
- Longer motor life

The new Life-Line "A" motor is still a step

ahead of the industry. How? Through balanced design and proved performance. Look at the improved materials and advanced mechanical and electrical components—each one matched to its neighbor.

New? Yes, but not untried. The new Life-Line does not discard the past . . . instead it profits by it and builds upon it. Each component of the new Life-Line has been screened in the laboratory, then proved on production-line motors. You're not buying "theoretical" performance. The new Life-Line motor, is a proved Life-Line.

J-21846



### GET THIS FREE BOOK

Here are all details on the new Life-Line "A" motor. Read about the new insulating materials—the new stator core—the new cooling methods—the new precision manufacturing techniques. Write for your free copy of Booklet B-6154. Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Penna.

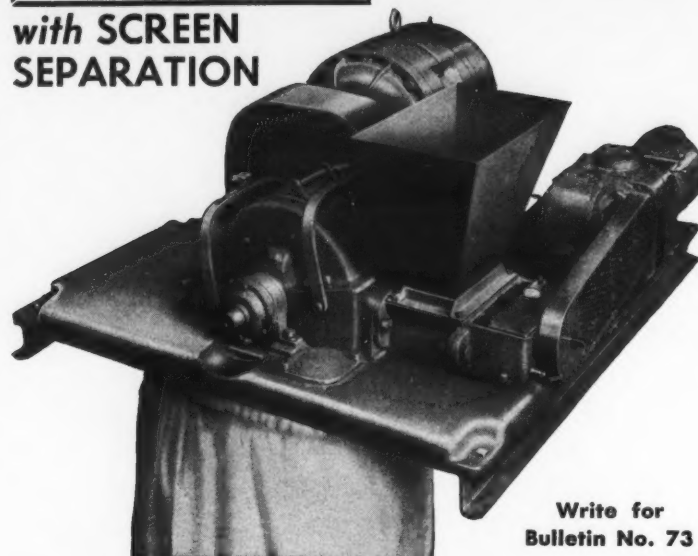
YOU CAN BE **SURE**...IF IT'S  
**Westinghouse**





# RAY-DUCER

with SCREEN  
SEPARATION



Write for  
Bulletin No. 73

## ... a notable addition to the RAYMOND LINE of Pulverizing Equipment

**COMPACT UNIT** — Complete assembly of mill, feeder, variable drive, motors and hopper mounted on a prefabricated base.

**ACCESSIBLE** — Lifting cover exposes main parts for inspection, including rotor, hammers, screen carrier and shaft.

**CLEANING** — Removal of screen carrier permits easy cleaning of grinding chamber.

**SCREENS** — Only few seconds required for changing screens. Various sizes and shapes of perforations available.

**UTILITY** — The Raymond RAY-DUCER is specially adapted for medium fine grinding and disintegration of soft materials.

Built in three sizes for small and medium capacities. Tell us your requirements — complete information will be sent you.

# COMBUSTION ENGINEERING, INC.

1317 NORTH BRANCH ST.  
CHICAGO 22, ILLINOIS

*Raymond Division*

SALES OFFICES IN  
PRINCIPAL CITIES

When inquiring check CP 7601 on handy form, pgs. 2-3

## NEED 600 to 5,000 PSI PRESSURES?

for processing, compressing, and hydraulic pressure-testing jobs...choose

### AMERICAN-MARSH TRIPLEX HIGH PRESSURE PUMPS

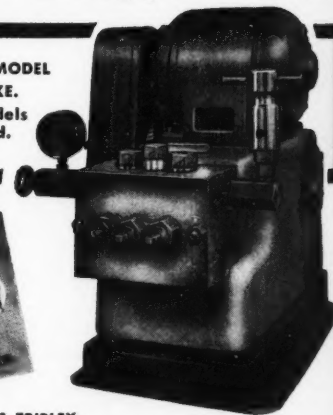
If you need a high-pressure pump, this American-Marsh Redi-Oiled Triplex may be just the answer! Selecting the *right* size for your application is easier because there are 32 models offered — ranging from 600 to 5,000 PSI — from 1.1 to 16.5 GPM capacities.

In chemical and other processing plants, the Triplex delivers excellent results for *backwashing* valves, pipes, vessels and equipment... for *high pressure testing* of pipes, valves, boilers and vessels... for *high pressure boiler feed*... and where *hydraulic compression* is used to laminate, mold, form, cast, straighten, bend or bale materials and parts.

You can get the full detailed story of construction quality — plus complete size and performance tables — by writing to American-Marsh.

*Pumps and Pumps only Since 1873*

**DIRECT DRIVE MODEL**  
**1½" - 2" STROKE.**  
**2½" stroke models**  
**are back geared.**



WRITE FOR THIS TRIPLEX  
BULLETIN 295 — TODAY!



BATTLE CREEK

MICHIGAN

In Canada:

American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

CENTRIFUGAL, TURBINE, STEAM AND POWER PUMPS FOR TESTING, PROCESSING, BOILER FEED, FIRE PROTECTION, ETC

For more information on products described in the advertisement of Westinghouse Electric Corporation on opposite side of sheet specify CP 7603... see information request blank between pages 2 - 3.

For more information on product above specify CP 7602... see information request blank between pages 2 and 3.

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## IDEAS

where a thin section is desired. Material is non-toxic and can be painted. It can be supplied in any desired length in widths ranging from 26 to 38", and in thicknesses from 0.005 to 0.125".

(Campco S-300 is product of Campco Div., Chicago Molded Products Corp., Dept. CP, 2717 N. Normandy Ave., Chicago 35, Ill. . . . or for more information check CP 7604, pages 2 and 3.)

### Deproteinized rubber insulations need protection from soil microorganisms

Because there are millions of feet of buried rubber-insulated cable in use by railroads, power companies and other industries, study of their failures due to microorganisms has become commercially important.

Until recent years such cables were protected from moisture by lead sheaths. These are heavy, costly, and subject to crystallization and electrolytic corrosion. Development of deproteinized rubber insulation, electrically stable on long exposure to water, made it possible to eliminate the lead sheath. However, without protective sheath, buried rubber-insulation cables are exposed to various hazards that may lead to eventual failure. One type of failure that can be forestalled by proper formulation of compounds is that caused by soil microorganisms.

Experiments have shown that both natural and synthetic rubber insulation can become electrically leaky when several types of fungus are able to force minute filaments through walls of insulation. By electrodepositing copper in leaky spots and tracing it with a microscope experimenters were able to show that fungi had created minute pores through the insulation.

Of the thousands of types of fungi present in soil, very few were found capable of growing through rubber. Four predominant rubber-attacking types were identified after being isolated from soil by passage through sealed agar-filled rubber tubes.

Only visible signs of microbe attack observed in these studies were found in natural rubber insulation. This showed pitting by colonies of soil bacteria. Pitting did not appear in synthetic rubber insulations even when they had failed electrically. Evidence is that only fungi, and very few specific types of these, are able to attack the synthetic rubbers, like GR-S, butyl rubber, and neoprene.

Electrical failure caused can be prevented or greatly delayed by compounding insulation with suitable fungus preventives. Care must be taken in determining their type and amounts however, since they must be effective without harming the necessary electrical characteristics.

(Original material for this article was presented at the Annual Meeting of the American Institute of Biological Sciences held at University of Wisconsin. Research data for subject was developed by Blake, Kitchin, and Pratt of Simplex Wire and Cable Co. of Cambridge, Mass.)

Clarified light phase

Controlled, concentrated solids phase

results that count!

SHARPLES DH-2SG NOZZLEJECTOR SPECIFIED

Controlled concentration of solids from slurries is a function which the Sharples DH-2SG Nozzlejector performs with high efficiency.

The re-cycle feature of this continuous centrifuge permits close control of heavy solids concentration without sacrifice of clarity, or throughput capacity. Re-cycling also provides an easy means of compensating for variation in feed concentration.

Sharples has engineered the DH-2SG with 40% greater capacity, without increasing the machine size, and without increasing power consumption per unit of throughput. It is being extensively used in the concentration of mill starch, gluten and other vegetable proteins, citrus products and similar applications where its completely sanitary construction is required.

The Sharples line of nozzle type centrifuges, both standard and re-cycling, are giving the right results in plants with a variety of concentrating problems. Call your nearest Sharples office or write for Bulletin 1253.

**SHARPLES**

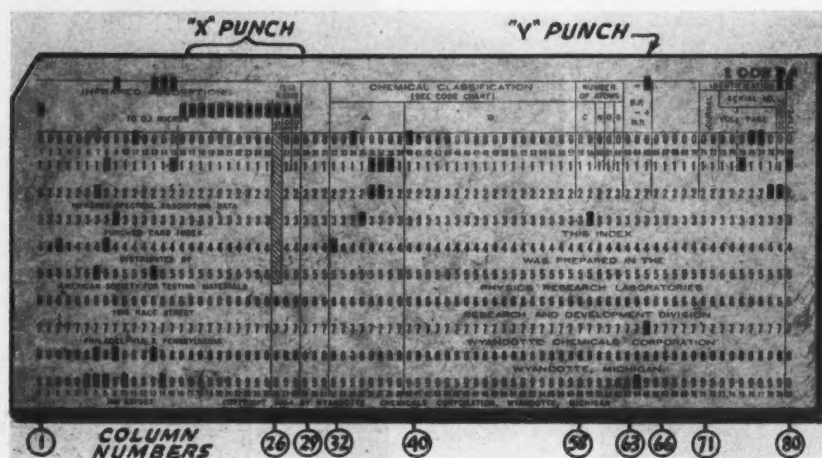
THE SHARPLES CORPORATION  
2300 WESTMORELAND STREET • PHILADELPHIA 40, PA.

NEW YORK • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO  
NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON  
Associated Companies and Representatives Throughout the World

When inquiring check CP 7605 on handy form, pgs. 2-3



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laboratory

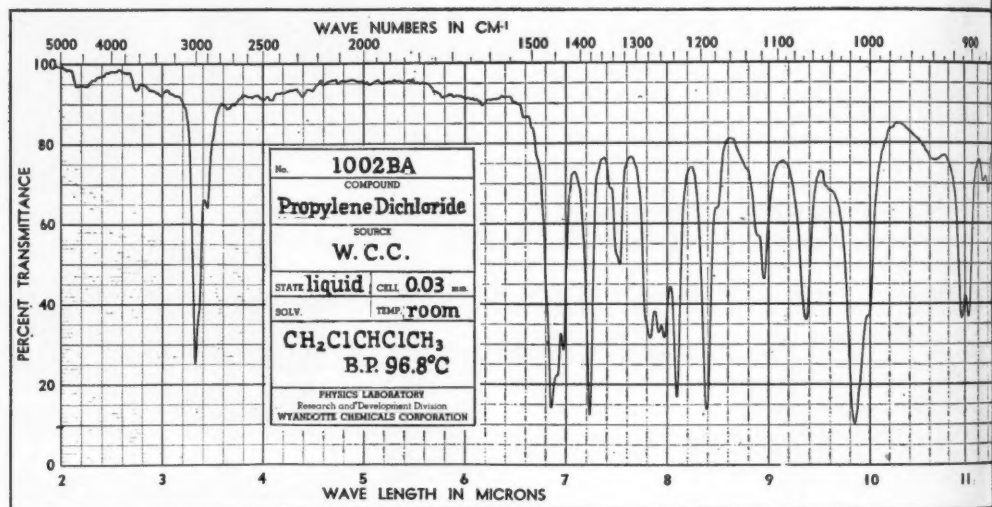


IBM card identifies propylene dichloride

IBM card indexing system allows rapid, accurate searches of spectrographic data by machine without handling spectra themselves

*punched cards  
fingerprint  
infrared  
absorption  
spectrograms*

Characteristic bands fingerprint propylene dichloride



**Fingerprinting** infrared absorption spectrograms on punched cards permits rapid identification of spectra from compounds or simple mixtures. Only machine required is an electric sorter, such as offered by International Business Machines, Inc. Including chemical structure, reactive groups, and boiling or melting points on card facilitates cross-indexing. Cards come already coded. ASTM compiles spectrographic data from authoritative sources. They are the sole distributor of the cards.

Designed to handle infrared spectral absorption data, indexing system covers range of 2 to 50 microns. General areas into which data are coded are indicated on the cards by printed lines and titles. These are shown on the IBM card illustrated, which is punched to identify propylene

dichloride. Columns 1-28 on the cards index absorption band positions.

Punching system provides for a resolution of  $0.1\mu$  from 2 to  $25\mu$ , and a resolution of  $1\mu$  from 25 to  $50\mu$ . Bands occurring from 2 to  $25\mu$  are recorded in card columns having same whole number value as band. Decimals are rounded off to nearest  $0.1\mu$ . Number corresponding to the tenth micron value is punched in column having same number as whole micron value. Two or more punches are made in the same column when spectrum shows more than one characteristic band in that range. (For example, the  $7-8\mu$  range in the spectrum for propylene dichloride, illustrated, has three significant bands. Therefore three punches appear in column 7 of the card.)

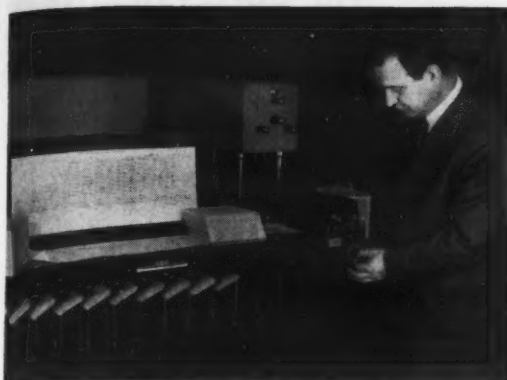
Bands occurring between 25 and  $50\mu$  are recorded in columns 26-28 in  $1\mu$  steps.

To indicate areas outside those covered by a specific spectrogram, and "x" overpunch (see card illustration) is placed in each column for which no data are available. A "y" overpunch is placed in a column to indicate a strong band. Strong bands are those which may be expected to persist in spectrum of a very diluted sample.

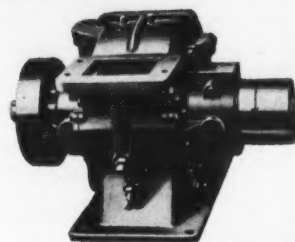
Columns 29-31 are reserved for future expansion of the system. At present nothing has been assigned to them.

Description of the chemical elements in specific organic compounds, and size and kind of gross structural features are coded into columns 32-39. (This is part "A" on card illustrated.) Gross

# STURTEVANT

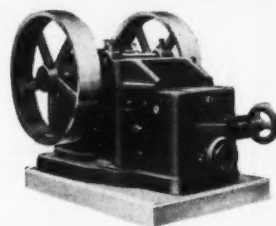


Electric card sorting machine searches spectrographic data rapidly



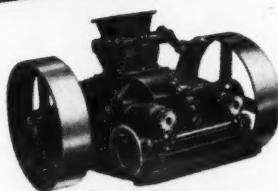
## LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



## LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 to 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.



## LABORATORY CRUSHING ROLLS

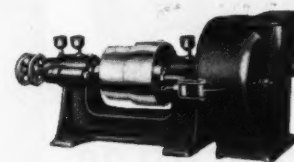
First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited outputs. Range of output for the 8 x 5 size is from 1/2 in. to 20 mesh — and for the 12 x 12 size from 3/4 in. to 20 mesh.

## Laboratory Equipment... assures accurate samples... cuts laboratory sampling costs

Sturtevant laboratory equipment have all the features of full-sized production machines with extra accuracy and wider range of adjustment built-in. They are fast... provide true samples of every batch processed.

All Sturtevant machines have "open-door" accessibility which permits quick, thorough cleaning... prevents the possibility of previous batches from contaminating new samples. Their rugged construction assures round the clock operation with practically no maintenance.

Investigate Sturtevant equipment for your laboratories. They will help you cut sampling costs... improve product quality... increase sales. Write for catalog, today.



## LABORATORY SAMPLE GRINDER

Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

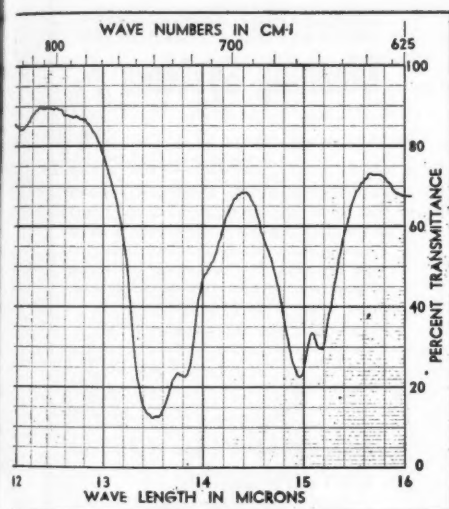
## STURTEVANT MILL COMPANY

119 Clayton Street, Boston 22, Mass.

Designers and Manufacturers of

CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

When inquiring check CP 7606 on handy form, pgs. 2-3



structural features are, for example, unsaturation, type and size of rings, and isomers. Under part "B" (columns 40-57) are coded groups of atoms that are considered reactive, as revealed by organic structural formulae. These groups are referred to as "code units."

Inorganics are indexed on same card form, using a different system of classification. A punch at position "O" in column 26 identifies all cards indexing inorganic spectra. This index is also divided into two sections. Under part "A" all elements that are present in the compound are identified. In part "B" inorganic radicals are coded.

Columns 58-62 provide space for recording total  
(Continued on next page)



## "Measuring CORROSIVE LIQUIDS is no problem with NIAGARA STAINLESS STEEL METERS"



**BUFFALO METER CO.**  
2892 MAIN STREET  
BUFFALO, N.Y.

Whether you're measuring caustic soda, acids, molten sulphur or many other corrosive liquids, you want reliable measurement all the time. NIAGARA METERS—made of type 316 stainless steel—resist damage from a wide range of corrosive products. Maintenance is kept to the absolute minimum because of the unusual simplicity in construction of NIAGARA METERS.

If you process or use liquids of a corrosive nature, it will be to your advantage to investigate NIAGARA.

Send in the Data Request blank below today

Gentlemen:

Please send me complete information on the use of economical NIAGARA METERS, based on the data below:

Liquid \_\_\_\_\_ Pressure \_\_\_\_\_ p.s.i.  
Temp. \_\_\_\_\_ °F.  
Flow rate \_\_\_\_\_ g.p.m.  
Maximum batch \_\_\_\_\_ gals.  
Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_

When inquiring check CP 7607 on handy form, pgs. 2-3

## FOR THE LABORATORY

(Continued from preceding page)

number of C, N, O, and S atoms in a specific compound. Overpunches ("x" and "y") are used to indicate numbers larger than 9.

Boiling or melting points are coded in columns 63-65. An overpunch distinguishes bp from mp and also indicates whether this temperature is above or below 0°C.

Columns 66-70 are reserved for individual user of a card deck. Special codes, of interest only to him, may be punched here.

### Data — Sources and Revisions

Since these punched cards are basically an indexing system which is gathered from spectral data as it exists in published form, each card bears a serial number or reference code. This keys it to the original data from which it was prepared. Code is placed in columns 71-79.

Column 80 indicates type of spectrographic data from which card was prepared. Provisions have been made for indexing spectral data from the visible and ultraviolet regions, in addition to the infrared region described here. Similar cards and appropriate codes are being prepared to index X-ray diffraction powder, mass spectral, and other types of related data.

New data are indexed and old data revised as they are published by abstractors working under the auspices of ASTM Committee E-13 and National Research Council Committee on Spectral Absorption Data. ASTM provides for exclusive distribution of punched IBM cards. These cards are prepared by Wyandotte Chemicals Corporation, Wyandotte, Michigan, according to the codes and systems originated there by Dr. L. E. Kuentzel, and modified by action of the Subcommittee on Standard Data of ASTM Committee E-13.

(Further information may be obtained from American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.)

### Turn of faucet delivers 10 gph of mineral-free water

Illustrated 6-page folder shows details of laboratory demineralizer. Unit operation is simple and foolproof. After connecting intake hose to tap, water is turned on to proper flow rate as visually indicated by flow meter. Raw water is transformed into water containing less than 5 ppm of ionizable salts and with a pH of 6.5 to 7.5. Only maintenance required of the 28 x 6 x 6" unit is occasional replacement of resin charge when electric conductivity meter indicates it is desirable. Operational diagram is included.

"Penfield Permanent Cartridge Demineralizer" is issued by Penfield Manufacturing Co., Inc. Dept. CP, 19 High School Ave., Meriden, Conn. When inquiring specify CP 7608 on handy form, pages 2 and 3.

## For 100% Effective REMOVAL and RECOVERY of DUST and DRY MATERIALS anywhere in your plant

### HOFFMAN Industrial Pneumatic Cleaning Systems

Permanently piped, stationary systems that pick up where present collectors leave off! On process operations or plant cleaning, Hoffman-designed systems provide big capacity for central collection of dust from several areas at same time. Sizes from 3 to 100 H.P., or larger to your requirements. Engineering survey, without obligation. Write for technical Bulletin A-939.

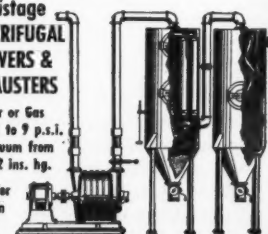
### HOFFMAN ALSO BUILDS

• HEAVY-DUTY INDUSTRIAL  
PORTABLE VACUUM CLEANERS  
4 Sizes — Write for Bulletins

• Multistage  
CENTRIFUGAL  
BLOWERS &  
EXHAUSTERS

For Air or Gas  
from 1 to 9 p.s.i.  
or Vacuum from  
2 to 12 in. hg.

Write for  
Bulletin  
A-932



Air Appliance Division  
**U.S. HOFFMAN**  
MACHINERY CORP.  
113 FOURTH AVE., NEW YORK 3, N.Y.

When inquiring check CP 7609  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Line of textile microscopes described, illustrated**

Special purpose microscopes for studying textile fibers are presented in four-page illustrated bulletin. Microscopes are used to identify fibers, determine quality, and detect impurities.

"Textile Microscopes" is issued by the American Optical Co., Instruments Div., Dept. CP, Box A, Buffalo 15, N. Y. When inquiring specify CP 7610 on handy form, pages 2 and 3.

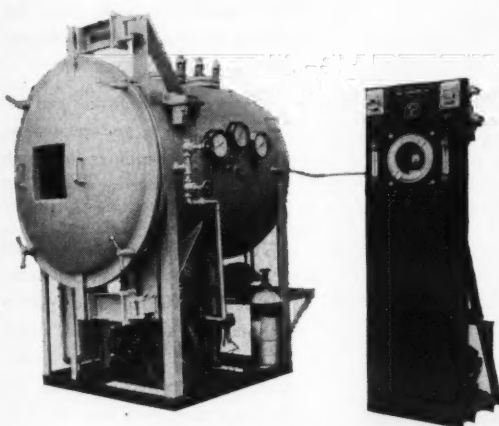
**Explosion chamber geared for high altitude lab tests . . .**

unit employs vacuum pump to simulate conditions up to 80,000 feet

**Uses:** To determine explosion-resistance of materials, components, sub-assemblies, and complete units when operated in an explosive atmosphere.

**Features:** Chamber is equipped with vacuum pump designed to facilitate tests involving explosions at altitudes up to 80,000 feet.

**Description:** Unit is comprised of cylindrical shell, explosion-inducing equipment, and control instruments. Standard size is 4' diam x 5' long, but other sizes are available.



Designed for high altitude testing

Control instruments automatically close valves when explosion mixture exists. Chamber remains sealed after relief valves close following explosion, permitting immediate recording of pressures and temperatures.

Chamber door is gasketed to seal it for vacuum runs. A 12 sq in window is provided for test observation.

(Explosion chamber is a product of Tenney Engineering, Inc., Dept. CP, 26 Avenue B, Newark 5, N. J. . . . check CP 7611, pages 2 and 3.)



U.S. Patent  
No. 2,282,078



Other Patents  
Pending

# Safe heating of inflammable liquids in **NEW** Aluminum Housing Type Electric Heating Mantles

The new line of metal-housed, electric heating mantles, shown here, have been carefully designed for safety in the same manner as those originally pioneered by Glas-Col. Likewise, these mantles are designed in such a way that heat input is supplied where it is most needed and only where it is needed. Available in glass fabric or quartz fabric construction, the mantles, which are recommended for maximum safety, are those constructed of glass fabric. These glass fabric mantles can be operated up to a maximum fabric temperature of 450C. Above this temperature, conditions are unsafe for the handling of inflammable solvents.

Glas-Col has a broad line of standard and special electric heating mantles to solve your laboratory heating problems.

Glas-Col Apparatus Co., Inc.  
Dept. CP, 711 Hulman St.  
Terre Haute, Indiana

## GLAS-COL

Trademark Registered U.S. Patent Office

Specialists in Laboratory and Pilot Plant  
Heating Problems

### ELECTRIC HEATING MANTLES

When inquiring check CP 7612 on handy form, pgs. 2-3



# PANALARM "50" ANNUNCIATOR SYSTEMS

PANALARM "50" PLUG-IN UNIT . . . hermetically sealed and most versatile ever developed . . . simply plugs into chassis to expand system . . . no wiring . . . no other connections. Corrosion-proof and suitable for Class I, Div. 2 locations.

## NEW functional flexibility with NEW "instrument-type" construction

Built-in flexibility of PANALARM "50" allows simple change-over to any operating sequence as required by present or future conditions. And, at the same time PANALARM "50" introduces a new instrument-type annunciator construction . . . adding to the long-term dependability of the entire system.

CABINET is substantial gauge steel with sturdy chassis and sub-door arrangement. It is pre-wired ready for installation, yet completely flexible without re-wiring.

PANALARM ANNUNCIATOR SYSTEMS are self-contained with either illuminated name-plates or bullseye visual signals. Both the audible signal and acknowledgment button are common to the entire system.

SEND FOR COMPLETE 40-PAGE MANUAL

Ask for Catalog 100-1



PANALARM PRODUCTS, INC.  
6312 North Broadway, Chicago 40, Illinois

## FOR THE LABORATORY

**Comparison colorimeter computes logarithmically to simulate eye and brain response . . .**

tristimulus-type filters permit measurement under daylight or artificial sources

**Uses:** For industrial color measurement and comparison. Transmission and reflectance samples can be accommodated and surface gloss included or excluded.

**Features:** Up to 15 filter combinations can be installed in one instrument including narrow-band interference-type combination for abridged spectrophotometry.

**Description:** Forced cooling, direct reading in terms of X, Y and Z adjusted values, dual area viewing for large and small sample areas, improved-type commutator system, and optical location means for small areas are all available in the redesigned Model "C" Color-Eye Colorimeter. Utilizing tristimulus type filters, the unit computes the values logarithmically to simulate the response of eye and brain.

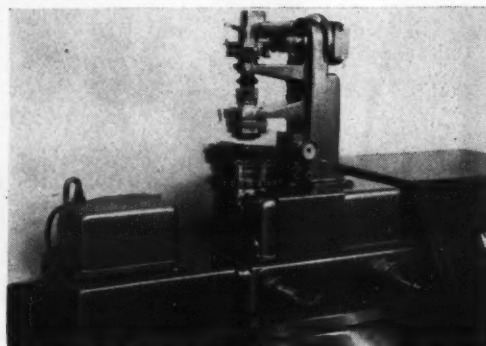
Standard instrument can be furnished with either diffuse or 45° normal illumination and viewing, with illuminators interchangeable if desired.

(Product of Instrument Development Laboratories, Dept. CP, 163 Highland Ave., Needham, Mass. . . . check CP 7614, pages 2 and 3.)

**Infrared microscope attachment gives spectra of single crystals with ease . . .**

records spectrum in about 20 minutes

**Uses:** The synthetic fiber industry, as well as chemical and medical research, will find unit of use in obtaining the infrared spectra of single crystals, single fibers and microscopic tissues.



Mounts directly on single beam infrared spectrometer to give spectra of single crystals, single fibers, or microscopic tissues

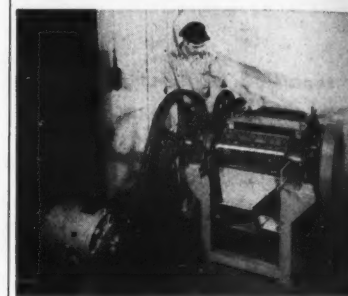
For more information on product at left, specify CP 7613 . . . see information request blank between pages 2 and 3.

## PRECISION CUTTING

WILL IMPROVE

YOUR MOLDING

Use Taylor-Stiles plastics and rubber CUTTERS



Made in various types and sizes with one characteristic in common—precision. For example:

Our dicing cutter cuts and cross cuts sheet stock into pellets of uniform dimensions in a single operation with a minimum of fines, first disc cutting the stock, then cross cutting it in a single continuous, one machine operation.

Another type machine cuts extruded stock into uniform sections suitable for molding into such products as rubber or composition soles or heels.

There's a Taylor-Stiles Cutter to perform any stock cutting operation required in rubber or plastics manufacture, adjustable for length of cuttings in all but one dimension in the pelletizer which first disc cuts then criss cuts the stock.

Let us know your rubber or plastics cutting problem. We can give you facts helpful in solving it.

**TAYLOR-STILES**  
and Company  
CUTTING MACHINES & GRINDERS

20 Bridge St., Riegelsville, New Jersey

When inquiring check CP 7615 on handy form, pgs. 2-3

Features:  
radiation  
reaches  
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Attach  
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directly  
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**Features:** Microscope is so designed that only radiation that has passed through the sample reaches the thermocouple. A complete spectrum can be recorded in about 20 minutes.

**Description:** Using the Infrared Microscope Attachment for Single Beam Spectrometers, infrared spectra have been obtained on single textile fibers less than seven ten-thousandths of an inch in diameter (17 microns). The unit attaches directly to any of manufacturer's Single Beam Spectrometers. Optical system is made up entirely of reflecting elements, so that it is free of chromatic aberration. Equipped with coarse and fine focusing adjustments for positioning the sample, unit also has an adjustable diaphragm which restricts the field of view precisely to area covered by sample. Optical path may readily be flushed with dry nitrogen to reduce the carbon dioxide and water vapor absorption bands on the infrared spectra.

(Manufactured by The Perkin-Elmer Corp., Dept. CP, Norwalk, Conn. . . . or for more information check CP 7616 on handy form, pages 2 and 3.)

#### Accuracy of $\pm 0.000002$ grams achieved with balance . . .

dialing off weights, air damping help speed 0.002 milligram readings and cut fatigue

**Uses:** For high accuracy ( $\pm 0.002$  milligrams) and high speed single pan weighings.

**Features:** Weights are not added but mechanically removed by dialing knobs.

**Description:** Micro balance of 20 gm capacity is said to speed up laboratory weighing. When a sample is placed on the pan, weights are removed by means of knobs on front panel, down to 0.01 gm of the weight of sample. Weights removed are automatically registered on a counter located on panel. The next third and fourth decimal places are read from projection system's ground-glass screen. Fifth and sixth decimal places are obtained by turning an optical micrometer. There is no manual handling of weights or calculating of last decimal places.

(Micro Gram-atic Balance is produced by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 7617 on handy form, pages 2 and 3.)

#### Describes UV monochromator

Bulletin provides 4-page detailed description of vacuum ultraviolet monochromator. Divided into six sections, brochure treats gratings, baffles, slits, camera, ultraviolet detector, and vacuum system.

Bul XL is available from Baird Associates, Inc., Dept. CP, 33 University Road, Cambridge 38, Mass. Specify CP 7618, pages 2 and 3.

Do YOU have operations similar to these?

Then check the extra savings possible with industry's great new profit-builder -

## Arnold O. Beckman OXYGEN CONTROL!

Where others are cutting costs, boosting profits . . .

#### ► Boilers, Direct Fired Heaters or Stills, Rotary Kilns

Arnold O. Beckman Oxygen Measurement on Flue gases insures greater savings through optimum combustion efficiency, lower fuel costs.

#### ► Hydrogenation, Hydrofining, Gas Compressors, Sulfur Grinding

Arnold O. Beckman Oxygen Control in explosive atmospheres protects lives, prevents costly damage, reduces fire risks.

#### ► Air Liquifraction, Production of Acetylene, Butadiene and Similar Gases

Arnold O. Beckman Oxygen Measurement insures higher product quality through minimum oxygen or air contamination.

#### ► Resin Kettles, Color Pigments, Product Storage

Arnold O. Beckman Oxygen Measurement of inert purge systems minimizes oxidation, protects product standards.

Send For This Helpful Data -



**BULLETIN 103:** Describes the Model G-2 Beckman Oxygen Analyzer — the instrument to use where maximum accuracy is essential. Model G-2 ranges are available for oxygen concentrations as low as 0-1000 parts per million — as high as 95-100% — or virtually any other range or combination of ranges. Bulletin 103 describes the unique magnetic operating principle used in Model G-2 Analyzers, equipment, accessories and typical applications.



**BULLETIN 108:** Describes the Model F-3 Beckman Oxygen Analyzer — the instrument designed primarily for industrial applications such as combustion control, catalyst regeneration, sulfur grinding, etc., which require an oxygen measuring range of 0-5%, 0-10%, 0-15% or higher. Bulletin 108 describes the unique magnetic operating principle used in Model F-3 Analyzers, gives equipment specifications and typical applications for this instrument.

**BULLETIN AD607:** Contains helpful charts and data on most efficient methods of controlling various combustion processes.

**BULLETIN AD610:** Contains helpful data on Chemical Applications, illustrates a typical installation, lists equipment required.

**BULLETIN AD611:** Contains helpful data on Tunnel Kiln Applications, shows typical installation, details equipment required.

**BULLETIN AD613:** Contains helpful data on measuring  $O_2$  content of High Purity Gases, shows typical sampling system, lists equipment required.

Arnold O. Beckman INC.

1020 Mission St., South Pasadena 24, California

Please send Bulletins checked below:

☐ 103 ☐ 108 ☐ 607 ☐ 610 ☐ 611 ☐ 613

Name \_\_\_\_\_

Company and Address \_\_\_\_\_

Position \_\_\_\_\_

### Want more details?

In addition to the applications highlighted above, there are many other processes where Arnold O. Beckman Oxygen Control brings new profits, new savings, new production efficiencies. Write for additional information, outlining your particular field of operation.

### CHECK THESE IMPORTANT ADVANTAGES OF ARNOLD O. BECKMAN OXYGEN ANALYZERS

**DIRECT MEASUREMENT:** Operating principle is based on unique paramagnetic properties of Oxygen. Arnold O. Beckman Oxygen Analyzers measure oxygen by direct physical means. No chemicals are required, no saturated atmospheres, no "hot wires" or other complex devices that may alter the composition of the sample gas.

**HIGH ACCURACY:** Readings are accurate within  $\pm 1\%$  of full scale for spans of 2%  $O_2$  and greater (e.g. .02%  $O_2$  on 0-2%  $O_2$  range). Accuracy is unaffected by ambient temperature variations.

**LINEAR SCALE:** Calibration of Arnold O. Beckman Oxygen Analyzers is strictly linear and the scale is accurate over the entire range.

**SIMPLE SAMPLING:** Only a small volume is necessary — 50-250 cc. per minute. Accuracy is not affected by variations in flow rate. Samples may be dry or saturated. Nothing is added to the sample, and it may be returned to the process unchanged. Many corrosive or reactive gases can be analyzed.

**COMPLETELY AUTOMATIC:** Sampling and measurement are continuous and automatic. No attendant is necessary.

**RUGGED CONSTRUCTION:** The unit is shock mounted to protect it from extreme vibration and shock. Maintenance is negligible—no chemicals, filaments, wicks, etc., to replenish—no orifices or glassware to clean and replace.

**MANY RANGES:** From a few parts per million to 100%  $O_2$ . Multi-range instruments are also available.

The above are only a few of many unique advantages incorporated into Arnold O. Beckman Oxygen Analyzers. More details are included in Bulletin 103 and 108.

When inquiring check CP 7619 on handy form, pgs. 2-3





Here's something  
**NEW**  
in  
straight-form thermometers

**THEY OFFER THESE OUTSTANDING PLUS FEATURES:**

**DURABILITY** — All parts of the new Rochester straight-form thermometers (except crystal) are of corrosion-resistant stainless steel. All are fused into a single unit by an exclusive welding process. Hermetic sealing assures easy reading of dial under any operating condition. No clouding.

**EXTERNAL RECALIBRATION** — Only Rochester thermometers can be recalibrated externally. A screw adjustment permits you to restore accuracy even if you

knock the thermometer out of adjustment with a hard blow.

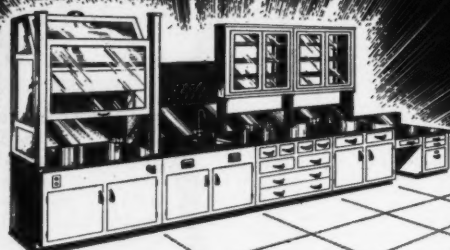
**SELECT YOUR STEM POSITION** — This thermometer is ordinarily supplied with the stem located at the bottom. However, it can be placed at the location you desire around the entire dial circumference. Available in stem lengths from 2 1/2 to 48 in. Send for further information today. Write: Rochester Manufacturing Company, Inc., 86 Rockwood Street, Rochester 10, N. Y.

**Rochester**  
DIAL THERMOMETERS GAUGES AMMETERS

Manufacturing Company, Inc.  
86 Rockwood St., Rochester 10, N. Y.



When inquiring check CP 7620 on handy form, pgs. 2-3



**LABRITECTURE** ...  
A New Technique of Laboratory Planning

METALAB offers a basic method in laboratory planning ... called, "LABRITECTURE." This technique will assist and direct you in the modernization and expansion of your laboratory or in planning a new one. Our new 4B Catalog and Manual will give you the sound basis for solving these laboratory problems.

For complete "LABRITECTURE" details request our new 180-page Catalog 4B.

**METALAB Equipment Corp.**

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METALAB EQUIPMENT CORP., 230 Duffy Ave., Hicksville, L. I., N. Y.

Gentlemen: Please send a copy of your new 180-page Catalog 4B to:

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 7621 on handy form, pgs. 2-3

**LABORATORY**

**Data on lab equipment**

Manufacturer's line of laboratory equipment, X-ray and analytical instruments is outlined in 64-page reference book.

Volume covers X-ray diffraction, spectrometry, spectrography, cameras, microscopes, and accessories.

"Research and Control Instruments — X-ray and Analytical Equipment" is issued by Research & Control Instruments Div., North American Philips Co., Inc., Dept. CP, 750 S. Fulton Ave., Mount Vernon, N.Y. When inquiring specify CP 7622 on handy form, pages 2 and 3.

**Cooling systems, optical meters eliminated in fluorimeter**

Uses: For mineral studies or other work involving ultraviolet fluorescence.

Features: Instrument uses as ultraviolet light source Black-light Blue lamps which develop little heat, eliminating need for air or water cooling system. This makes it possible to mount sample slide, light source and detecting unit close together, making optical meter unnecessary and permitting lower voltage across photomultiplier tube.

Description: Instrument is composed of three units—ultraviolet light chamber and sample slide, detecting and measuring unit, and power supply.

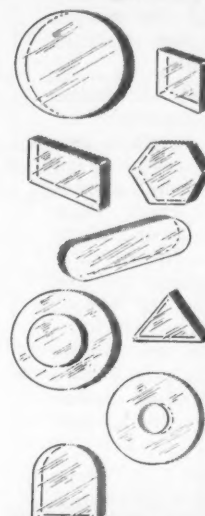
Light chamber consists of aluminum block which holds ultraviolet lamps and contains opening for sample slide. Slide contains compartments for sample melt and fluorescent standard, automatically centers for reading position and corrects current shunt for check on standard reading before and after each sample reading.

Photomultiplier in detecting unit is separated by filters which screen out unwanted light. Current is measured by stable vacuum tube voltmeter. A regulated power source compensates for input-output voltage and tends to compensate for heater voltage variation.

No change in output occurs in line voltage variations between 90-120v. Ripple voltage is less than 0.03v

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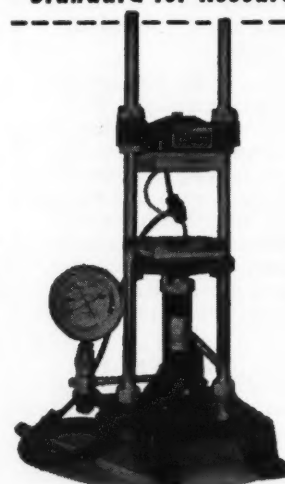
We can deliver immediately specially cut round, square, rectangle or odd-shaped Sight Glasses in 8 thicknesses (1/4" to 1"), sizes up to 24" x 60". Write, wire or phone for quotation. Ask for Sight Glass Bulletin.

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When inquiring check CP 7623 on handy form, pgs. 2-3

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52 RIVER ROAD, SUMMIT, N. J.

When inquiring check CP 7624 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## LABORATORY

AC at full power output voltage of 640v DC.

Fine voltage control, in series with photomultiplier tube, and coarse voltage switch, in parallel with power supply, are provided. Constant voltage transformer is recommended, since power source does not regulate voltage of ultraviolet light source.

(Jaco G-M Fluorimeter is a product of Jarrell-Ash Co., Dept. CP, 26 Farwell St., Newtonville, Mass. . . or for more information check CP 7625 on handy form located between pages two and three.)

### Heater is designed for heavy-duty service . . .

9" square hot plate made of cast iron for hard use

**Uses:** Designed for heavy-duty service in laboratory or plant.

**Features:** Heater top plate is made of cast iron, is suitable for longer wear and heavier loads where aluminum may not be applicable.

**Description:** Surface plate temp is regulated by four-heat control (without load): L-400°, LM-535°, M-710°, and H-930°. Unit heats slowly or quickly as desired.

Heating plate, with one-inch thickness of block insulation, is suspended in top section with ventilating channels underneath and on four sides.

Construction insulates control switch, supporting table against heat from top plate. Units operate in single voltage for 115 or 230v 25/60 cy AC; 230v unit may be operated on 115v with approximately half the normal temp.

Hot plate is 9" square, 6" high, and weighs 15 lb.

(Models 2615 (115v) and 2630 (230v). hot plates are manufactured by Thermo Electric Mfg. Co., Dept. CP, 476 Huff St., Dubuque, Iowa . . . or for more information check CP 7626 on handy form between pages 2 and 3.)

For more information on product at right, specify CP 7627 . . . see information request blank between pages 2 - 3.



## Skill and Ingenuity at Work for You

Your Eimco filter is a product of skill and ingenuity wrought from more than half a century of service to the process industries.

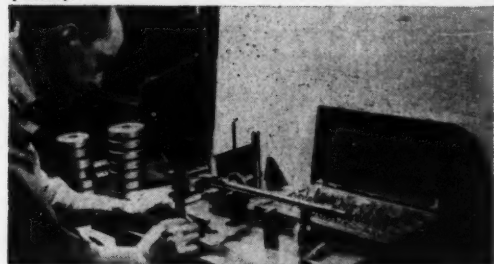
As a matter of fact, think about it — you wouldn't want it any other way. When you've worked out a process that requires the culture or slurry to be handled just so to produce your laboratory results, you can't afford to recommend anything but the finest equipment all the way through the plant.

Your finest product in pressure or vacuum Filtration is an Eimco.

Costs — look beyond first cost — to the savings in higher recovery of values, greater clarity of filtrate, longer trouble free life in the equipment and in the case of the unit shown above, an Eimco precoating unit, about double the life of one precoat.

Write for information on the finest filters available anywhere to The Eimco Corp., P. O. Box 300, Salt Lake City 10, Utah.

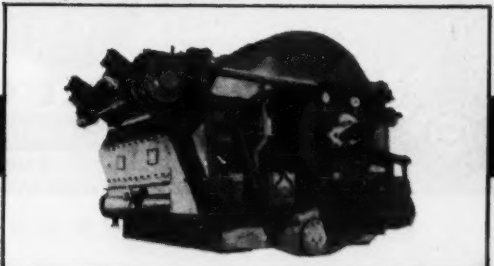
Each Eimco filter for the special process industries receives individual attention in engineering (above) and inspection (below).



Skilled mechanics with a field knowledge of filtration problems machine and assemble your specialized Eimco filter.



The finished product is completely assembled in the shop even if dismantling is necessary for shipment. An Eimco man will supervise its installation.



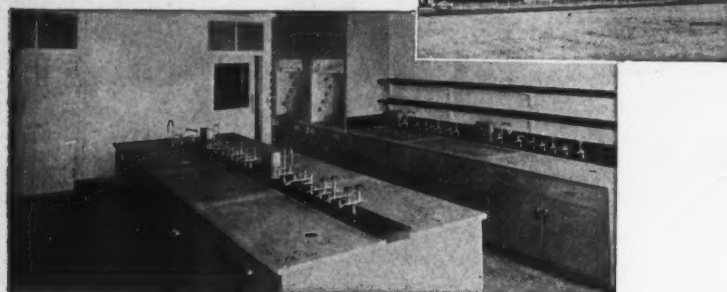
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Salt Lake City, Utah, U.S.A.  
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Alberene offers you expert engineering assistance based on more than fifty years experience in equipping laboratories. For information and technical advice, just write Alberene Stone Corporation of Virginia, 419 Fourth Avenue, New York 16, N. Y. Or better yet—why not visit our nearest branch office?

### **ALBERENE STONE**

When inquiring check CP 7628 on handy form, pgs. 2-3

**Evaporate...  
Bake... Dry...  
at 200° to 1000° F.  
under  
Controlled Conditions**

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When inquiring check CP 7629 on handy form, pgs. 2-3

## FOR THE LABORATORY

### **Gives data on electrical measuring instruments**

Handy guide to selection of electronic and electrical measuring instruments and laboratory accessories is given in 12-page, two-color bulletin.

Among instruments illustrated and described are electronic electrometers, electronic relays, audio frequency oscillators, Wheatstone bridges, potentiometers, resistance standards, frequency meters, fluxmeters, and oscilloscopes.

Bul 108 is issued by Dept. Adv. 108CP, Central Scientific Co., 1700 Irving Park Rd., Chicago 13, Ill. When inquiring specify CP 7630 on handy form, pages 2 and 3.

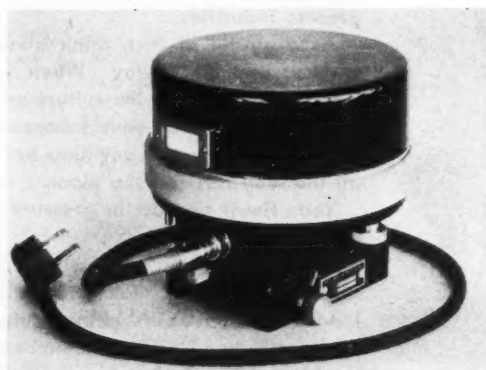
### **Back reflection camera designed for determination of atomic lattice constants . . .**

gives good resolution with reasonable exposure

**Uses:** For precise determination of atomic lattice constants in X-ray diffraction work.

**Features:** Provides excellent resolution with reasonable exposure periods and covers a range of Bragg angle values from 59 to 88.74°.

**Description:** The Back Reflection Camera has a radius of 60 mm and weighs 9½ lb. Camera components are machined from aluminum and bronze castings, finished in crystalline black and chrome trim. V-notch reference marks along the lower edge of the film-turret facilitate accurate calibration and eliminate errors due to film shrinkage.



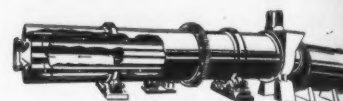
Determines atomic lattice constants

Slit system is mounted in a machined wedge and is held in place by a knurled screw. Knife edges of the wedge produce two sharply defined vertical lines on the exposed film. From knowledge of the distance between the lines, film can be readily calibrated for precise determination of line positions.

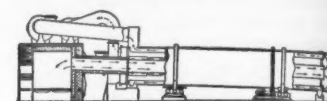
Specimen holder is rigidly mounted and pivots on a steel shaft. It is slowly oscillated in a small arc by means of a cam driven by a 115 v, 60 cycle motor.

## RUGGLES-COLES

### Dryers, Kilns and Coolers



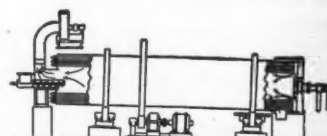
**DOUBLE-SHELL  
SEMI-DIRECT HEAT DRYERS**



**DOUBLE-SHELL  
INDIRECT-HEAT DRYERS**



**SINGLE-SHELL DIRECT-HEAT  
COUNTERFLOW DRYERS**



**STEAM-TUBE  
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**ROTARY KILNS**



**SINGLE-SHELL DIRECT HEAT  
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Write for Bulletin 16-D-13

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When inquiring check CP 7631 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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town,  
7633 o

Camera includes a coupling to which a hose can be connected for gas filling or evacuation. For a series of exposures, hose may be left connected to the camera fitting since it is part of the motor housing which remains in position on the track when camera is taken to dark room.

(Manufactured by Research and Control Instrument Div., North American Philips Co., Inc., Dept. CP, 750 S. Fulton Ave., Mount Vernon, N. Y. . . . or check CP 7632 on handy form, pages 2 and 3.)

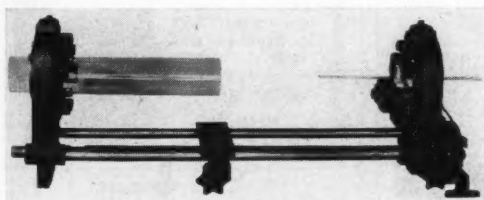
### Repair 12" diam glassware or form with tubing on lathe . . .

tubing of any length and up to 100 mm diameter can be worked conveniently

Uses: For making ring seals, tees, flanges, tapers, glass fusings, closures, and a variety of glass repairs.

Features: Sleeve-grip chuck permits quick set-ups of practically all forms of glass work without elaborate accessories.

Description: Lab-Lathe is designed for specialized glass work in the laboratory and for certain production operations. Unit is adaptable for use as a vertical lathe. Floating tailstock with fingertip control eliminates backlash and is detachable when large pieces are worked on the headstock.



Handles all lengths of tubing

Tubing of any length and up to 100 mm diameter can be mounted through the spindle. Extension bars can grip a variety of glass shapes. Sizes up to 12" diameter can be accommodated.

Normal chuck speed is 32 rpm, length between chucks 36", radial clearance 8" and through-spindle diameter 4". Net weight is 150 lb.

(Lathe is a product of Bethlehem Apparatus Co., Inc., Dept. CP, Front and Depot Streets, Hellertown, Pa. . . . or for more information check CP 7633 on handy form, pages 2 and 3.)

Using rotameters? Don't miss the new sizing method shown on pages 190-192

# PACKAGED V-BELT FAN UNITS

BETTER FOR MANY AIR HANDLING APPLICATIONS

## MOTOR DRIVEN ASSEMBLIES—NO EXPENSIVE FOUNDATIONS REQUIRED

Clarage V-belt Ready Units come in 18 sizes — capacities to 12,000 c.f.m. . . . within their range, the ECONOMY ANSWER to almost any INDOOR or OUTDOOR air handling requirement.

Use Ready Units and save the expense of building separate motor foundations. Use Ready Units and eliminate alignment problems. Use Ready Units for installations in record time and at lowest cost consistent with quality fan equipment.

Ready Units with or without Outdoor Covers shipped immediately. Specially constructed units for handling corrosive gases, etc., take a little longer.

WRITE FOR READY UNIT CATALOG 515 giving details, capacities and dimensions on the most modern "packaged" fan units available today — address, CLARAGE FAN COMPANY, Kalamazoo, Michigan.

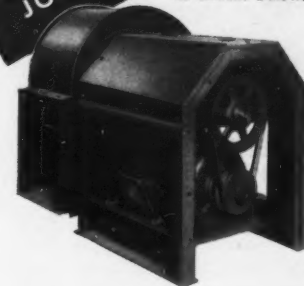


Cut at left shows standard Ready Unit as built in three largest sizes. These larger units, too, can be equipped with Outdoor Covers.

## NEW! CLARAGE DEVELOPMENT

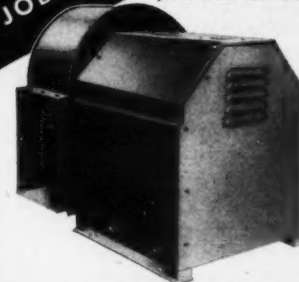
Clarage Ready Units are a notable advance in "packaged" fan units — highly efficient, compact, quiet in operation. And, like all other Clarage equipment, you can RELY on them for dependable, economical service.

### INDOOR JOBS

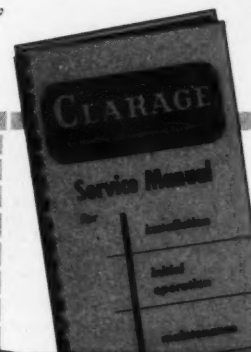


Standard Ready Units (except three largest sizes) afford protection to fan bearings, motor and drive as shown below.

### OUTDOOR JOBS



Cut below shows Ready Unit equipped with (easily removable) Outdoor Covers shielding all working parts from rain and snow.



## 68 PAGES of VALUABLE INFORMATION

New Manual shows how to properly install and service Clarage fans, blowers and air conditioning units . . . valuable information adaptable to almost any type of fan job. Sent without charge to factory executives, engineers and maintenance officials.

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Conditioning Equipment

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA Canada Fans, Ltd. 4285 Richélieu St. Montreal

When inquiring check CP 7634 on handy form, pgs. 2-3



# You can have **DRY AIR** with exact moisture control



ASSEMBLING ELECTRONIC PARTS

● This Niagara "Controlled Humidity" method gives you the **MOST EFFECTIVE** Air Conditioning because its cooling and heating functions are made completely separate from adding or taking away moisture. This assures you always a precise result. No moisture sensitive instruments are needed.

**MOST FLEXIBLE.** You can reach and hold any condition in response to instrument settings, or vary it as you wish.

**EASIEST TO TAKE CARE OF.** The machine is accessible, the control circuits are simple and easy to operate, and there are no solids, salts or solutions to be handled.

**MOST COMPACT.** It does a very large amount of work in a small space.

**INEXPENSIVE TO OPERATE.** At normal atmospheric temperatures (unlike systems that use refrigeration to dehumidify) it needs no summer re-heat.

**FOR  
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TESTING MACHINES  
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When inquiring check CP 7635 on handy form, pgs. 2-3

## FOR THE LABORATORY

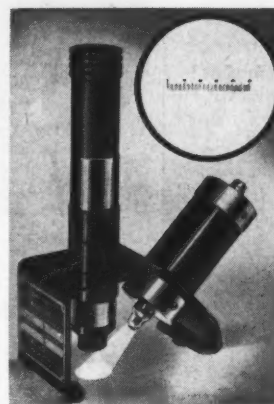
**Direct-measuring reticle,  
built-in lighting  
in microscope**

Uses: For laboratory, shop, or production work where medium-power microscope is advantageous.

Features: Unit incorporates built-in illumination, direct measurement reticle, and high quality flat-field optics of more expensive instruments.

Description: Model 232 Clarkstan industrial microscope has magnification of 20x and 40x, high resolving power, excellent light efficiency. Direct measurements by .002" and .004" are furnished with reticle.

(Model 232 Clarkstan Industrial Microscope is a product of Gardner Laboratory, Inc., Dept. CP, Bethesda, Md. . . or check CP 7635A, pages 2 & 3.)



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PICCO Coal Tar Aromatic Solvents are available in a complete series of grades, from low to high boiling points, each grade being carefully fractionated to closely maintain specifications.

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When inquiring check CP 7636 on handy form, pgs. 2-3

# Eliminate Costly and Dangerous **WATER HAMMER** in your piping system with

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**Silent  
CHECK VALVES**

Yes . . . compact, durable and dependable Williams-Hager check valves will eliminate expensive and troublesome noise in your piping system. Available for standard pipe sizes from 1" to 20", they operate with maximum efficiency in horizontal, vertical or angular. Send coupon for complete details.



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Please send a copy of Bulletin W.H.451 on  
"Water Hammer, Cause, Effect and Control in  
Piping Systems."

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When inquiring check CP 7637  
on handy form, pgs. 2-3

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CP, 464  
CP 7639

APRIL,

## FOR THE LABORATORY

### Catalog presents 1000 models of hydrometers, thermometers

Thirty-six-page catalog features approximately 1000 different models of hydrometers and thermometers. All are made in accordance with requirements of NBS, ASTM, API, and other official sources of standard specifications.

Catalog of Hydrometers and Thermometers is issued by Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N. Y. When inquiring specify CP 7638, pages 2 and 3.

### Meet low power, high impedance input requirements with lab relay . . .

two sec time delay in circuit minimizes chatter with no loss of sensitivity

**Uses:** For general lab use where low power, high impedance input requirements are necessary. Can handle substantial power loads with minute currents.

**Features:** Sensitive switching device incorporates a time delay of one to two seconds in circuit, which minimizes chatter but is too short in duration to cause a loss of sensitivity.

**Description:** Front panel of relay houses two 115v AC electrical outlets, each of which supplies 10 amp. One outlet energizes when regulator closes; the other operates inversely.

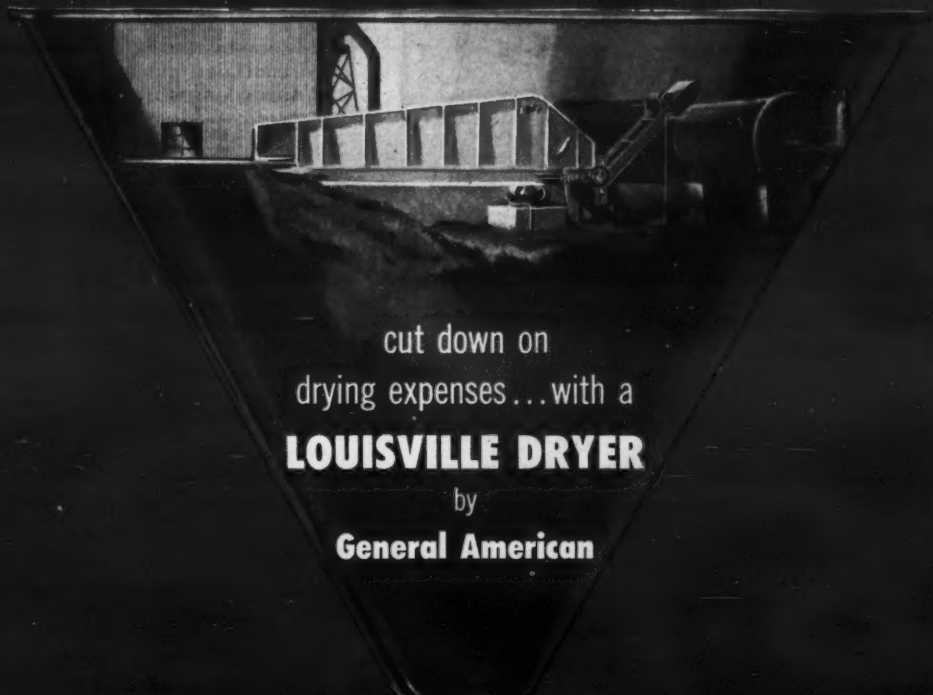


Handles substantial power loads with minute currents

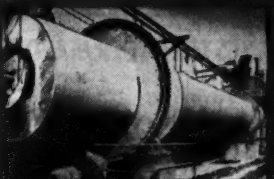

Circuit is isolated from line by transformer and grounding lead is provided with line cord. This eliminates possibility of shock to operator and erratic function when used with constant temp baths with exposed heaters.

Relay has maximum input current of 4 micro amp; maximum power controlled is 10 amp @ 115v on each outlet simultaneously; operation from 115v, 50-60 cy circuits. Case dimensions are  $5\frac{1}{2} \times 4 \times 4\frac{3}{4}$  inches.

(Relay is product of E. H. Sargent & Co., Dept. CP, 4647 W. Foster Ave., Chicago 30, Ill. Check CP 7639, pages two and three.)




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**LOUISVILLE DRYER**  
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**General American**

Louisville Rotary Cement Dryer with rotary shell and external water sprays.

Louisville Rotary Cement Tube Dryer with internal type sprays, water, hot air, and utilizing 60% of moisture for useful heat.

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A Louisville engineer can tell you every saving, every improvement, every bit of increased efficiency before you invest. A Louisville Dryer is fitted to your job. It's the result of a Louisville engineer's complete analysis of your particular problem, of knowing your problem throughly, and solving it by applying 30 years of drying experience, and using the testing facilities of General American's laboratories.

More than ever, a Louisville Dryer has turned a losing operation into a profitable one. Write or call for a Louisville engineer to make an obligation-free survey of your operation.

When inquiring check CP 7640 on handy form, pgs. 2-3



## EXPUL GASES, EXPLOSIVE FUMES AND DUSTS

with Propellair "CS" Fans

Widely used under  
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HIGH  
EFFICIENCY

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LONG  
LIFE

■ Propellair "CS" Fans are rugged, heavy-duty units for duct installation. The cast aluminum alloy airfoil propeller is housed in a welded heavy-gauge steel duct section and belt guard with internal bearing assembly.

Robbins & Myers All-Weather Motor located outside airstream. Sizes 20" to 60", with certified air deliveries of 3750 to 85,000 c.f.m. Available with corrosion and abrasion-resisting finishes and with ventilated bearings suitable for operation in high temperatures.



**Simplified Installation**  
Propellair "CS" Fans are built to fit standard duct sizes without the need of elbows. The fan drum has front and rear flanges drilled for easy mounting into duct system. Our engineers are at your service for fan selection and application advice. Write for Bulletin 650C.



Man Cooler Direct Drive Sky-Blast Vaneaxial Extended Shaft

When inquiring check CP 7641 on handy form, pgs. 2-3

## FOR THE LABORATORY

**Precision, stability at  $3 \times 10^{-13}$  amp  
for accurate microcurrent  
measure, control . . .**

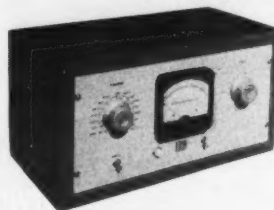
Two micro-microammeters — Model V Vibrating Reed and Logarithmic Scale — measure, control, and record microcurrents at  $3 \times 10^{-13}$  amp with five per cent accuracy, little zero drift.

Model V employs vibrating-reed modulator as basic unit. Instrument has 13 operating current ranges,  $3 \times 10^{-7}$  through  $3 \times 10^{-13}$  amp full scale. Readings are relatively insensitive to vibrations, independent of line fluctuations from 103-107 v. Instrument can monitor four

inputs alternately, connects to any standard 50 mv recorder.

Logarithmic Scale unit has wide current range on single scale, for use when input currents may fluctuate.

(Model V and Logarithmic Scale micro-microammeters are products of Beckman Instruments, Inc., Dept. CP, S. Pasadena 1, Calif. . . . check CP 7641A, pages two and three.)



## CHEMICAL PLANT IN WESTERN GERMANY

*employed in the following industries:  
seeks to acquire production rights for chemical products*

- PAPER INDUSTRY
- RUBBER INDUSTRY
- LACQUER INDUSTRY
- TEXTILE INDUSTRY
- PLASTICS INDUSTRY
- COSMETIC AND PHARMACEUTICAL INDUSTRY
- SOAP, WASHING AGENTS AND FOOD INDUSTRY

*Particularly interested in new developments.*

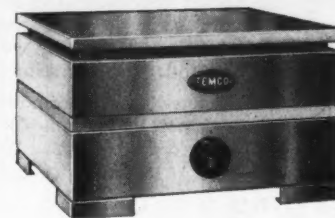
Apply to: Box No. K.R. 9679

WESTDEUTSCHE ANZEIGEN-GESELLSCHAFT "WESTAG"  
32-34 Schildergasse, Cologne, Germany

When inquiring check CP 7642 on handy form, pgs. 2-3

## TEMCO HOT PLATE

for heavy duty service  
in the factory or laboratory



TYPE 2600 . . . 9" SQUARE

Here's another new model in the wide line of highly dependable TEMCO hot plates. It is designed especially to stand *hard use* for prolonged periods. Built with extra strength to support heavy loads . . . smooth cast iron top plate ideal for all types of work. Nickel-chromium alloy heating element embedded in a refractory plate of high thermal conductivity. Well ventilated for efficient, trouble-free operation. 4-heat control: L-400°; LM-535°; M-710°; H-930° F. (without load). Two models for 115V and 230V a-c operation. 9" square, 6" high. \$33.50. Write for data and name of nearest dealer.

**THERMO ELECTRIC MANUFACTURING CO.**

476 HUFF STREET, DUBUQUE, IOWA

When inquiring check CP 7643 on handy form, pgs. 2-3



There's  
Something  
in the  
Air!

Industry and government alike are using this versatile Air Sampler to help solve one of today's most vexing problems — AIR POLLUTION! . . . both outside and inside of plants!

Capable of sampling large volumes of air for prolonged periods, this PORTABLE AIR SAMPLER has successfully sampled for particles as small as 1/100th of a micron in diameter.

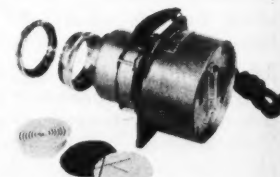
Write for details

THE **Staplex** CO.

AIR SAMPLER  
DIVISION  
777 Fifth Avenue  
Brooklyn 32, N. Y.

AND THE  
**Staplex**  
HIGH VOLUME  
AIR SAMPLER

*Tells you what it is!*



A Necessity for Maintaining  
Today's Advanced Health  
Standards

When inquiring check CP 7644 on handy form, pgs. 2-3

CHEMICAL PROCESSING

### Bulletin lists glass stirrers and tube line

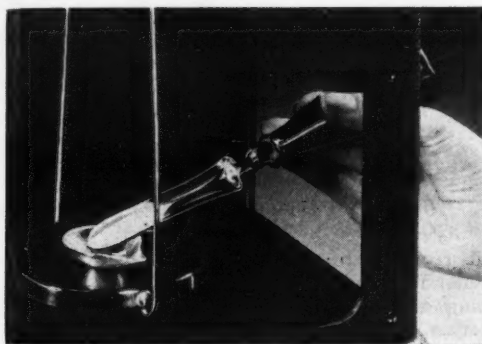
Four-page, two-color bulletin lists dimensions for complete line of precision bore stirrers and interchangeable parts. Also included is listing of styles and sizes of precision bore tubing which finds application in rotameter tubes, voltage regulators, dashpots, bearings, and capacitors.

Bul 53-1 is issued by Wilmad Glass Co., Dept. CP, Franklin and Flower Streets, Landisville, N.J. Specify CP 7645, pages 2 and 3.

### Midget vibration-motor permits dead-stop control in spatula dispensing . . .

vibration motor in spatula handle reduces measuring time

Particles can be dropped singly, in a steady stream, or in rapid bursts from an electrically vibrating spatula. Motor fits into the hand as would an electric razor. Stainless-steel spatula vibrates 60 times



Reduces measuring time

a second. Vibrator will also break up loosely bound aggregates of crystals. Unit uses 115 v, 50-60 c AC.

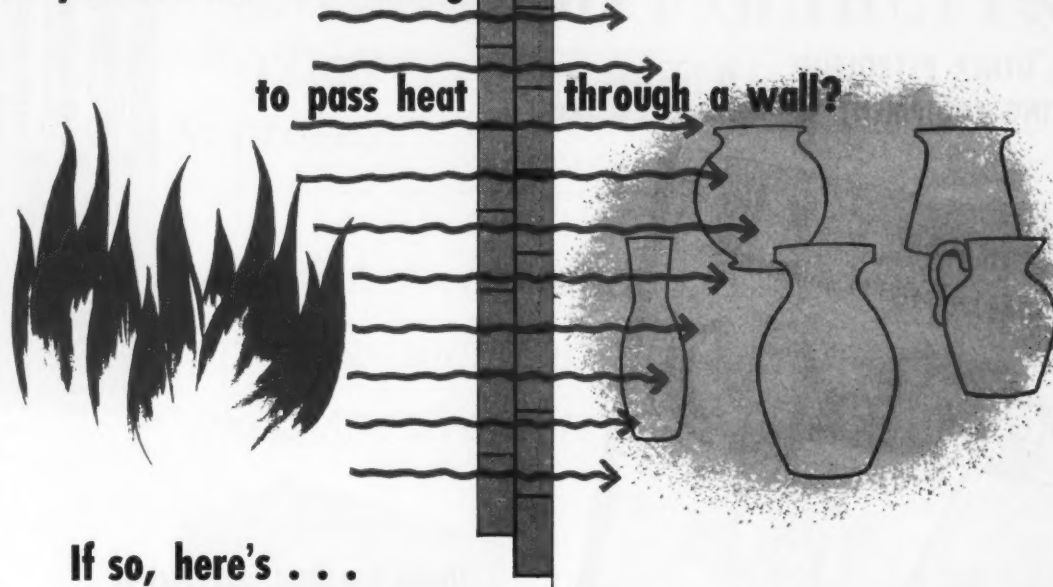
(Vibro-Spatula is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . or for more information check CP 7646 on handy form, pages 2 and 3.)

### Gives data on spectrophotometer using wedge interference filter

Illustrated leaflet provides description and operation data for spectrophotometer which embodies a wedge interference filter. Holder accepts sample tubes from 19 to 22 mm without adapter.

Leaflet describing Model 61 spectrophotometer may be obtained from Harold Kruger Instruments, Dept. CP, P.O. Box 164, San Gabriel, Calif. Specify CP 7647, pages 2 & 3.

## Do you use indirect heating



## If so, here's . . . A refractory that's "heat-transparent"

This is how three commonly used refractories compare in thermal conductivity, (BTU/hr, sq ft and °F/in. of thickness at 2200 F). From left to right: silicon carbide, aluminum oxide, and fireclay.

While you ordinarily think of a refractory as a heat-containing material, CARBORUNDUM's silicon carbide is anything but. It actually transmits heat 11 times faster than fireclay. Practically as fast as the high temperature alloys!

This property is silicon carbide's greatest asset. It makes it ideal for retorts, muffles, and hearths . . . or wherever you pass heat through a wall. Take one case: When used to replace the fireclay arch of a Mannhiem furnace, output was doubled—and the fuel input ratio was cut 50%! And that's not an exaggerated example.

This same property enables silicon carbide to absorb and release up to five times as many BTU's per second as fireclay. It's ideal for checkers, recuperators, and other heat-exchange equipment. On the other hand, it's equally good where heat has to be dissipated (e.g. arc shields, pot settings, etc.)

But the clinching advantages are that it has a tested crushing strength of over 10,000 psi at 2500 F . . . is safe to use up to 3000 F . . . withstands abrasive/erosive wear-and-tear far

better than metals . . . is inert to acid attack . . . and, in general, outlasts other materials, even under the most destructive conditions known.

In fact, this ability to withstand extreme conditions distinguishes all CARBORUNDUM's super refractories (including one of the best insulating materials for high temperature work). These range all the way from a cotton-like ceramic fiber to super-dense refractories that are cast like metals. So whether you need to conduct heat, or contain it, CARBORUNDUM's "man-made minerals" offer unusual possibilities. We'd like to explore their interesting features with you.

## CARBORUNDUM

Registered Trade Mark

Dept. Y-44, Refractories Division  
The Carborundum Co., Perth Amboy, N. J.

- ☐ As a starter, send literature only.  
☐ I'd like first-hand information. Please phone for appointment.

Name \_\_\_\_\_ Position \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

When inquiring check CP 7648 on handy form, pgs. 2-3



a new catalog ....

# on FISHER/TAG

AND OTHER PETROLEUM  
TESTING EQUIPMENT



This new catalog completely describes the comprehensive line of Fisher/Tag and other petroleum testing equipment and provides a ready reference to important petroleum tests.

All the petroleum testing apparatus represented in this catalog for conducting tests outlined by the American Society for Testing Materials are in exact accordance with their specifications. When methods or specifications change, the necessary alterations are made to meet the latest ASTM specifications.

There are a great many testing instruments and apparatus for the petroleum industry available today. Know all about them through this very useful new free catalog.

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Write to Dept. HH on your company stationery and a copy of this new catalog will be sent to you immediately. There is absolutely no obligation.

**FISHER  SCIENTIFIC**

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NEW YORK (14)  
635 Greenwich St.

ST. LOUIS (18)  
2850 S. Jefferson Ave.

MONTREAL (3)  
904 St. James St.

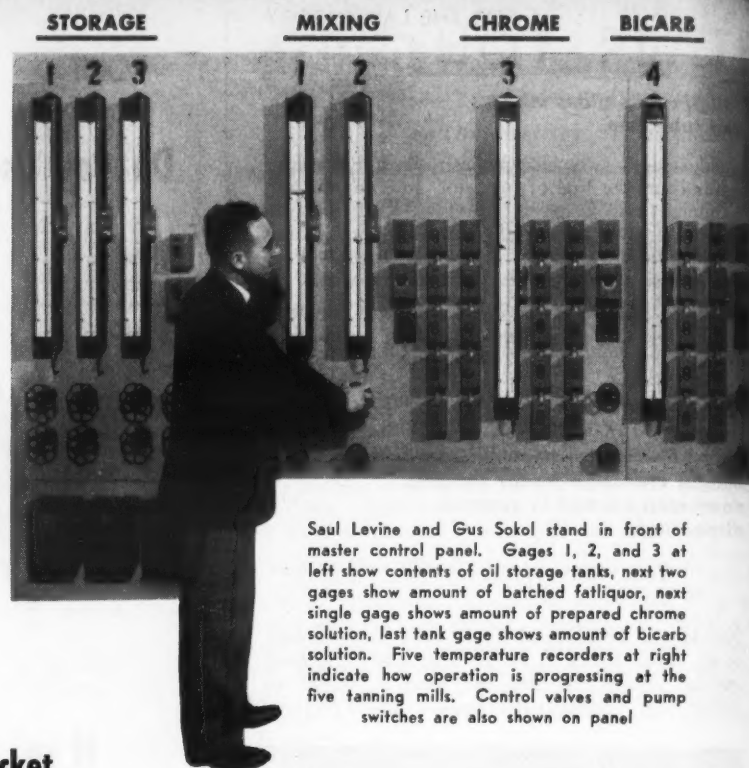
WASHINGTON  
7722 Woodbury Dr.  
Silver Spring, Md.

TORONTO (8)  
245 Carlaw Ave.

America's Largest Manufacturer-Distributor of Laboratory Apparatus and Reagent Chemicals

When inquiring check CP 7649 on handy form, pgs. 2-3

## instrumentation



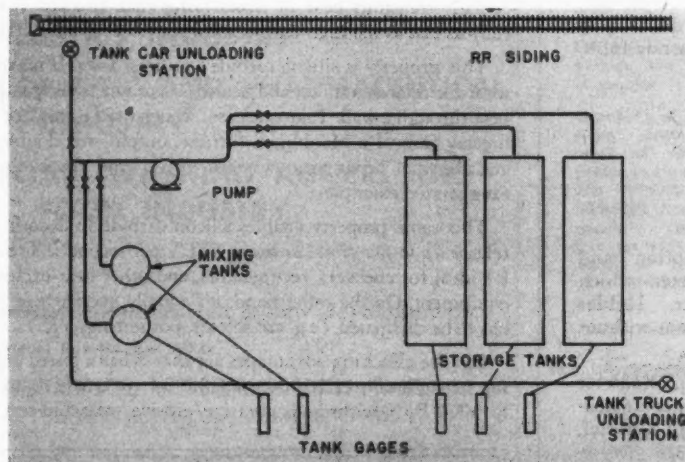
Saul Levine and Gus Sokol stand in front of master control panel. Gages 1, 2, and 3 at left show contents of oil storage tanks, next two gages show amount of batched fatliquor, next single gage shows amount of prepared chrome solution, last tank gage shows amount of bicarb solution. Five temperature recorders at right indicate how operation is progressing at the five tanning mills. Control valves and pump switches are also shown on panel

Drum handling and bucket  
brigades vanish as

## tannery switches to automatic handling

Oils are shipped in by tankcar  
and truck. System permits  
automatic batching, mixing,  
and delivery to fatliquor mills

Until recently the Glove Leather Division of Colonial Tanning Co., in Milwaukee was receiving tanning materials and handling them the same way most other tanneries do. But with the beginning of a streamlining program which Colonial has undertaken, semi-automatic methods which approach those of the most streamlined chemical plant have been put into effect.



Greatly simplified diagrammatic sketch shows how tank cars are unloaded to storage and oil is pumped from storage to mixing. Tank gages indicate contents at all times. (Chrome and bicarb tanks are not shown in this sketch)

## TEMPERATURE IN MILLS



As it stands now, the system consists of three horizontal storage tanks, mixing tanks, tank gages, timer-controlled pumping stations, temperature recorders, and accessories. Although further changes are being undertaken, the tanning department is already benefiting from the instrument system employed.

Like most other tanneries, Colonial used to receive fatliquoring oils in drums and mix small batches of proper blends as they were needed. Finished fatliquor would then be dipped into drums with buckets.

This has been changed by a new system which works this way: oils are received by tankcar or

(Continued on next page)



General view of system components shows one of oil storage tanks (upper left), fatliquor, chrome, and bicarb tanks at center, and master control panel at right

## New acetylene production process

uses

the

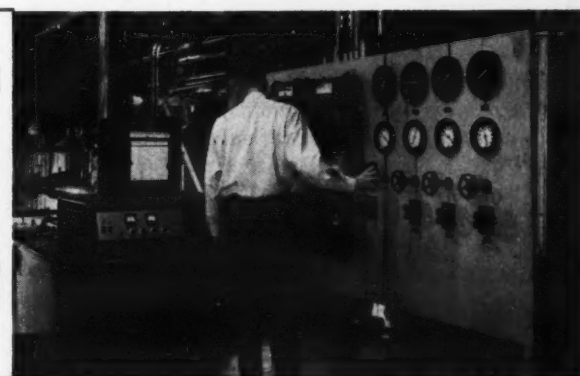
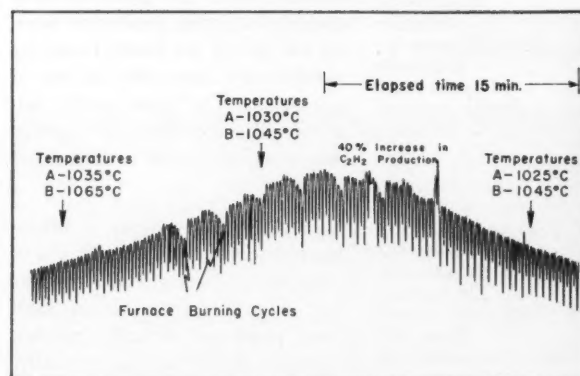
Consolidated continuous process—monitoring

mass spectrometer..... for "on the spot" control



The new Consolidated Model 21-610 continuous process monitoring mass spectrometer played a part in the development of the Wulff Process for the commercial production of acetylene. Requiring only 110 volts and a small quantity of cooling water for operation, this self-contained, completely portable instrument was placed on stream in the pilot plant, where it monitored various gas streams under a variety of imposed conditions. Samples from 19 different points, introduced through a common manifold for analysis, made possible among other things: (1) the monitoring of feed stock, (2) evaluation of cracking gas composition versus temperature, (3) determination of fuel gas composition, (4) measurement of acetylene or ethylene content in recycle gas, (5) diacetylene scrubber efficiency, (6) acetylene or ethylene absorber efficiency, (7) solvent recovery and/or loss, (8) final product purity.

The chart, below, left, illustrates the versatility and practical value of the Model 21-610 as a production control instrument. The mass-26 peak of acetylene was monitored in the cracking gas coming directly from the unit as the furnace temperature was varied. From right to left, the temperature was slowly increased. The rise in the cyclically scanned 26 peak indicates rising acetylene content of feed stock. This test showed that acetylene increased approximately 40% with a temperature rise of 5 degrees C. Using the chart as a reference, guesswork was eliminated and maximum future production assured. Write for Bulletin CEC-1824-X15.



## Consolidated Engineering CORPORATION

ANALYTICAL INSTRUMENTS FOR SCIENCE AND INDUSTRY

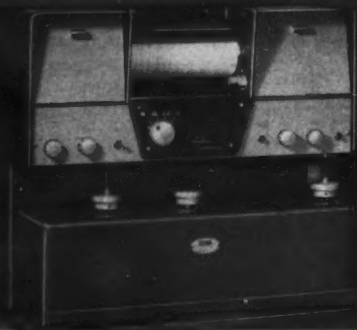
300 North Sierra Madre Villa, Pasadena 15, California

Sales and Service through **CEC INSTRUMENTS, INC.** a subsidiary with offices in: Pasadena, Atlanta, Dallas, Detroit, New York, Philadelphia, Washington, D. C.

When inquiring check CP 7650 on handy form, pgs. 2-3



# Laboratory Robot stretches man-hours!



**A Case History of  
the NEW Beckman  
Percent-Transmittance  
Recording  
Spectrophotometer**

*"In five months, this robot spectrophotometer has saved us better than seven months of a skilled chemist's time."—  
Roger W. Truesdail, Ph.D.*

A leading independent laboratory, Truesdail Laboratories, Inc. of Los Angeles, has used a Beckman Model DR Recording Spectrophotometer in from 30 to 40 percent of all its testing and research work. Read what Dr. Truesdail and his staff have to say about this revolutionary, time-saving apparatus:

*Among its many assignments, the Beckman Recording Spectrophotometer is used at Truesdail Laboratories in the examination of alkaloids, synthetics, drugs in human and animal body fluids, foreign constituents in drugs, heavy metals in plastics, caffeine in coffees, theobromine in cocoa, and scores of others.*

**For more information on this remarkable analytical robot, write for Data File 96-11.**

*Automatic percent-transmittance recording with the famous Beckman Model DU Quartz Monochromator.*

*Runs three samples simultaneously, at speeds exceeding the fastest manual plotting.*

*Carefully designed to preserve the high inherent accuracy of the single-beam Model DU Spectrophotometer.*

"Complete spectra recorded with this instrument offer a major advantage. Where formerly we ran just a few points on a curve — possibly missing important data — we now obtain a full, neatly-printed spectrum on easy-to-file notebook paper."

"The Beckman Recording Spectrophotometer has put spectrochemical analysis on a mass production basis. In use five or six hours a day, its speed saves us more than the time of one chemist. The "three sample" feature enables direct Beer's Law, pH or other comparisons on the same chart."

"If anything, the accuracy of this robot instrument surpasses that of our most skilled manual operators. We find it much easier to obtain maximum sensitivity through automatic operation than is possible manually."

## Beckman *division*

BECKMAN INSTRUMENTS, INC.  
SOUTH PASADENA 1, CALIFORNIA

When inquiring check CP 7651 on handy form, pgs. 2-3

## INSTRUMENTATION

(Continued from preceding page)

tank truck. Unloading stations allow the oil to be pumped directly to storage tanks whose contents (in pounds) are shown on master control panel. When a batch of fatliquor is needed, oil is pumped from storage tank to mixing tanks where tank gage allows proper number of pounds of each oil to be blended to form enough fatliquor for the day's run. Product temperature in the tanks is maintained by submerged combustion heaters. Fatliquor is pumped to tanning drums as needed.

Safeguards are provided throughout for proper proportioning and quantity of feed. For instance, while pounds added to mixing tanks show directly on control panel, a check can be made by reading pounds removed from storage. Where fatliquor blend is being pumped to mills, electric timers control length of pumping period so that proper amount is added to mill by simply pressing push-button.

Before new system went into operation, a carload of oil drums would be unloaded by four men using a lift truck to stack them three high on pallets. With the new system, a single hose is connected to tankcar and contents are pumped into storage tanks unattended.

Before the new system each batch of solution was prepared individually by weighing up required quantities of each oil. These were mixed and cooked at required temperature and poured into spillbox of the tanning drum. Repeated seven or eight times each day for each of the operations (fatliquoring, chrome tanning, and neutralization with bicarbonate of soda), about 20 to 25 separate batches were mixed each day. Empty drum storage and disposal was also a problem.

With new system, a button is pushed and a timer set for automatic delivery of required weight of each oil to one of the mixing tanks. Here fatliquor is mixed and cooked thermostatically. When fatliquor is needed at any drum, another button dispatches the proper quantity.

New system will also encompass bicarb and chrome solutions when it is completed. These will be handled in bulk also. An interesting sidelight, it has been shown to be practical to receive chrome in solution rather than as a dry powder. Despite higher freight cost, price can be lowered considerably since chrome manufacturer does not have to evaporate the material initially.

### Controlling Tanning Operation

Five, 2-point roundchart temperature recorders are also located on the panel board. These show temperature at the five tanning drums. Besides their obvious function of showing that proper temperatures were maintained throughout the tanning and fatliquoring runs, recorders are actually very valuable as checks on proper scheduling and operation. For instance, if washing or drumming operations are cut short, changed conditions in temperature indicate this on the roundchart. Proper operation can be checked by comparing temperature periods with a master chart.

Colonial figures to save money with the system in

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labor, freight, spillage, and especially in maintaining controlled quality of leather. One specific example is the fact that a supervisor and five helpers were required to produce 50,000 sq ft of leather in one shift. With the new system a supervisor and one helper can produce 60,000 sq ft in the same period. Furthermore, quality controls and elimination of drum handling make a round-the-clock operation possible.

It is expected that within 60 days of the initiation of operation of the completed system, production will have been doubled without changing labor requirements by one single man.

Though much work remains to be done in bringing this system to the envisioned goal of plant managers Gus Sokol and Saul Levine, and their consulting engineer Robert D. Rodwell, it is already far ahead of conventional tannery practice. These men are willing to discuss their control methods with other tanners or interested chemical processors.

(Tank gages for reading stored contents directly in pounds were furnished by King Engineering Co., Dept. CP, 415 Detroit St., Ann Arbor, Mich. . . . check CP 7652, pages 2 and 3.)

(Two-point temperature recorders for the drums were furnished by The Foxboro Co., Dept. CP, 38 Neponset Ave., Foxboro, Mass. . . . or for more information check CP 7652A, pages 2 and 3.)

#### List control systems for ovens, furnaces, dryers, kilns

Illustrated 48-page catalog gives complete, up-to-date information on control systems for ovens, furnaces, dryers, and kilns.

Included in bulletin are pyrometer controllers, recorders and indicators, bulb-and-tubing recording or controlling thermometers, electric control relays, motor operators and controllers, electric and air-operated control valves.

Bulletin contains section supplying information necessary for ordering complete control system, conveniently indexed to meet any application.

Bul No. P1260 is issued by The Bristol Company, Dept. CP, Waterbury, Conn. When inquiring specify CP 7653 on handy form, pages 2 and 3.

#### Need instrumentation for that process? . . .

You'll find just what you need in the alphabetized, itemized Product Directory on pages 213 to 216. All subjects and products presented in ads and editorial columns are there.

## Here's SK's NEWEST DESIGN for Rate-of-Flow Measurement— the SAFEGUARD ROTAMETER

As an answer to industry's increasing demands for *safety* and *convenience* in rate-of-flow measurement of liquids and gases, SK has designed its newest Rotameter—the Safeguard Rotameter.

This Rotameter has specific application for measurement in the higher temperatures and pressures of modern process technology, or where dangerous or valuable liquids and gases are being used.

#### FOR SAFETY:

The completely enclosed steel meter case has detachable safety glass windows, protects the metering tube from external shock, and also protects the operator if accidental tube breakage occurs.

#### FOR CONVENIENCE:

Wider front and rear sight glass windows give maximum visibility. The detachable metal reference scale can be supplied in either units of flow or in millimeters for use with calibration charts, as desired.

Extreme construction rigidity gives precise end fitting alignment, eliminates pipe stresses on the tube.

Can be adapted for remote recording and controlling of fluid rate of flow.

Write for full information, including sizes and capacities, on this newest Rotameter design.

Glass metering tube has cylindrical inlet and outlet pieces of the same outside diameter — allowing use of the same size packing rings on either end of the tube.

Horizontal inlet and outlet can be connected in four different positions.

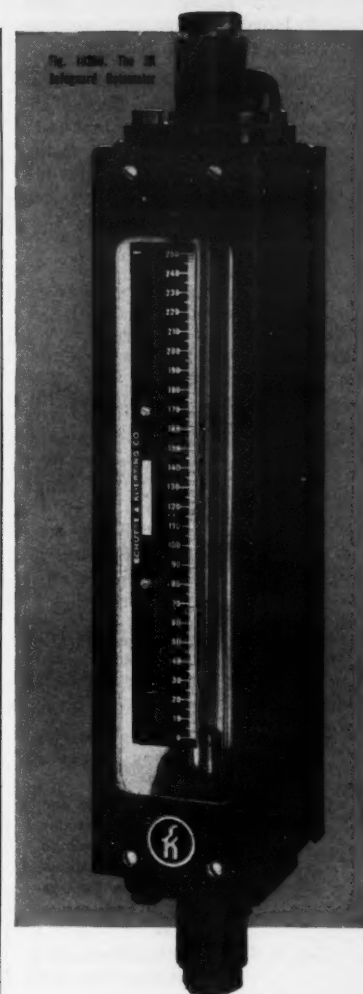
Two types of metal mandrel made tubes are available—the "HCF," a High Capacity Fluted tube, or the "R," a conical tapered tube without flutes.

Various rotor designs and materials permit wide capacity range within one meter.

End fittings are available in cast iron, bronze, and stainless steel.

Neoprene packing gives corrosion resistance, tight seal, long service life. Other packing material is available.

Rotor removal and tube cleaning without dismantling easily done through non-locking sealed clean-out plug.



Manufacturing Engineers

When inquiring check CP 7654 on handy form, pgs. 2-3



## INSTRUMENTATION

### Describes Infrared gas analyzer

Two-page, illustrated bulletin announces manufacturer's higher-sensitivity infrared gas analyzer. Modification of maker's Model 21, unit can now detect changes as low as 1/3 ppm. Included are capacities, applications, simplified diagram.

"Infrared Gas Analyzer" is issued by the Liston-Becker Instrument Co., Inc., Dept. CP, 649 Hope St., Stamford, Conn. When inquiring specify CP 7655 on handy form, located between pages 2 and 3.

### Controls temp safely from -30 to 1200°F



**Uses:** Non-indicating temperature controller operates over composite range from -30 to 1200°F, is suitable for use in explosion-proof systems.

**Features:** Controller has been approved by Underwriters' Laboratories for use in the following atmospheres:

Class I, Group C, Atmospheres containing ethyl ether vapor

Class I, Group D, Atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors, and natural gas

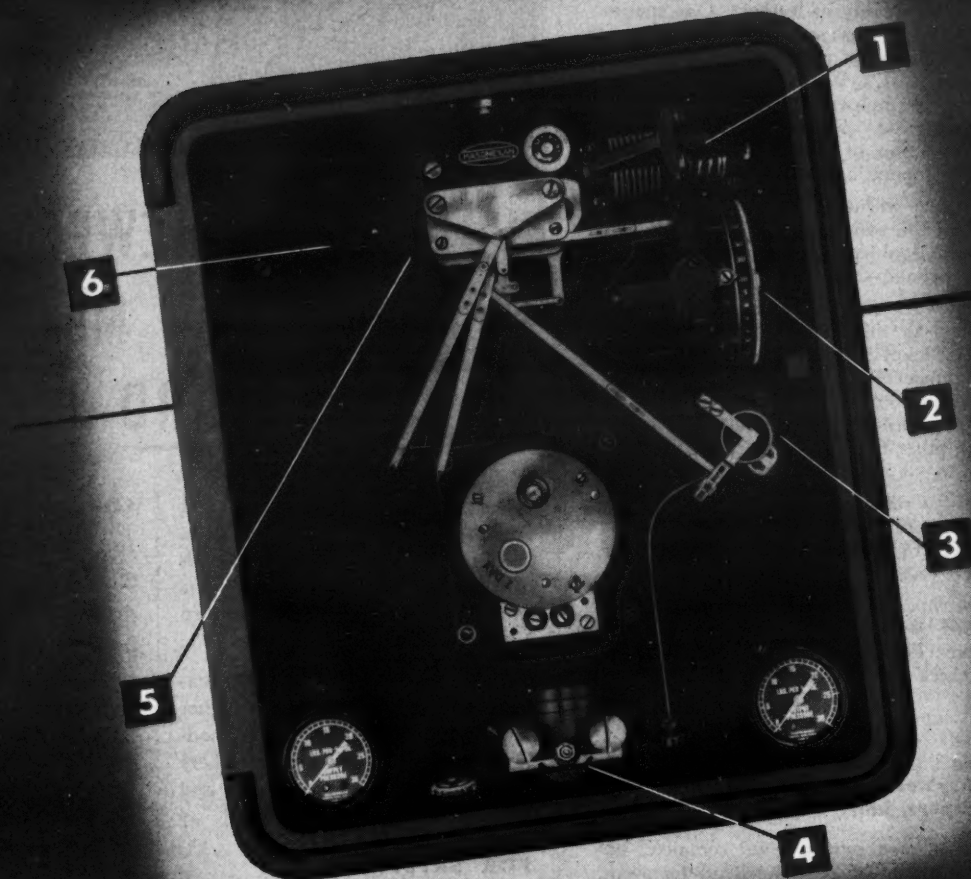
Class II, Group E, Atmospheres containing metal dust

Class II, Group F, Atmospheres containing carbon black, coal, or coke dust

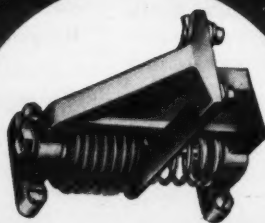
Class II, Group G, Atmospheres containing grain dust

**Description:** Controller is designed to maintain temperature by controlling flow of steam, oil, gas, or electricity to heating appliance. May also be used to regulate flow of coolant.

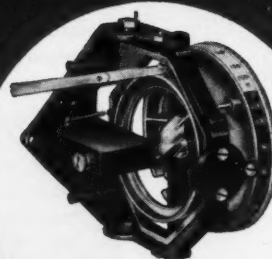
Calibrated temperature scale can be supplied so that it is possible to set control temperature directly on dial of instrument. Uncalibrated controls have dials with



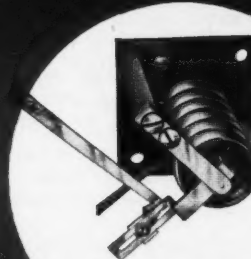
MASONILAN 60000 SERIES PNEUMATIC CONTROLLER



**1. PROPORTIONAL UNIT**  
interchangeable with proportional-reset unit.



**2. GIMBAL UNIT**  
combines primary and feedback motions - basic in all controllers.



**3. PRIMARY ELEMENT**  
helical or spiral bourdon, or bellows as required.



**4**  
with

A HIGH *C<sub>a</sub>* PRODUCT

divisions from 0 to 50 so that control point can be duplicated or logged.

Switch rating is 4 amp at 125 volt, 2 amp at 250 volt non-inductive AC. For pilot duty, rating is 50 volt-amperes inductive load. Ten elements are available for covering temperature range from -30 to 1200°F.

(Controller is manufactured by The Partlow Corp., Dept. CP, New Hartford, N. Y. . . . or for more information check CP 7656 on handy form, pages 2 and 3.)

#### **High-low voltage indicator features ruggedness**

High-low voltage indicator is used with equipment whose efficiency is dependent upon a certain voltage range. Unit is a bakelite panel with two glow-lamp pilot lights marked "High" and "Norm," and two test jack receptors.

Panel is mounted on cast aluminum Type FS junction box with conduit fittings. Two standard models, both of which work on AC or DC, are available. Model indicates low of 95 to 105 volts and a high of 130 to 140 volts. Model 960 has a low of 190 to 210 and a high of 235 to 255 volts.

(Indicator is a product of Industrial Devices, Inc., Dept. CP, Edgewater, N. J. . . . or for more information check CP 7657 on handy form, pages 2 and 3.)

#### **Gives info on static pressure controls**

Two-color, single-page bulletin gives pertinent data on manufacturer's static pressure controls, designed for low pressures.

Cat 104 is issued by the Henry G. Dietz Co., Dept. CP, 12-16 Astoria Blvd., Long Island City 2, N.Y. When inquiring specify CP 7658 on handy form located between pages 2 and 3.

For more information on product at left, specify CP 7659 . . . see information request blank between pages 2 - 3.

MASON-NEILAN

## **Masoneilan 60000 Series Controller IS SIMPLE AS A B C**

### **One Setting of basic "3-in-1" controller**

selects on-off, proportional, or differential-gap control; direct or reverse action; proportional band or differential-gap setting.

### **Easy to Set, Adjust, Test and Service —**

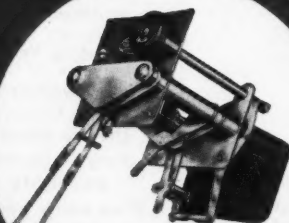
all settings made without removing chart; all subassemblies complete and directly accessible; all air passages manifolded; four-position transfer switch in manual control subpanel.

### **Easy to detach and interchange subassemblies**

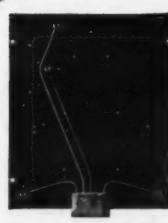
from backplate-manifold to vary desired control function; for cleaning or servicing.



**4. RELAY PILOT**  
with cleanable orifice and  
integral filters.



**5. PEN MOVEMENT**  
includes gearless index  
setting.



**6. BACKPLATE-MANIFOLD**  
supports subassemblies; con-  
ceals, supports, tubing;  
eliminates fittings.  
(Rear View)

## **MASON-NEILAN REGULATOR CO.**

1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

*Sales Offices or Distributors in the Following Cities:*

New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland  
Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa  
Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle  
Mason-Neilan Regulator Co., Ltd., Montreal and Toronto



can you really buy  
high accuracy at low cost?



**of course you can!** This new Fielden Resistance Thermometer Recorder, for instance, measures temperatures up to 950°F. with an inherent accuracy of  $\pm 0.5\%$  of full scale! But it sets a new price standard because . . .

. . . we've eliminated the usual design complexities. For example, this self-balancing type recorder uses an AC-actuated bridge circuit that eliminates direct current source and replacement of dry cells. An interchangeable measuring unit permits change in range or measurement without re-wiring. The complete recorder is assembled from only 5 easily replaceable and interchangeable sub-units.

This is Fielden simplified instrumentation—all the accuracy you can possibly use—at an economical price. Mail the coupon for full details.

DOLLAR FOR DOLLAR—YOUR BEST INSTRUMENT VALUE

**Robertshaw-Fulton**  
CONTROLS COMPANY

FIELDEN INSTRUMENT DIVISION  
2920 N. 4th St., Dept. G, Philadelphia 33, Pa.

Send full details on Fielden simplified:

- |   |  |
|---|--|
| <input type="checkbox"/> TEKTOLOG Electronic Recorder       | <input type="checkbox"/> Resistance Thermometer Recorder |
| <input type="checkbox"/> TELSTOR Electronic Level Indicator | <input type="checkbox"/> MULTIPPOINT Recorders           |
| <input type="checkbox"/> TEKTO Electronic Level Control     | <input type="checkbox"/> Series 97 Temperature Controls  |

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_



Fielden TEKTOLOG  
Recorder



Fielden TELSTOR  
Indicator



Fielden TEKTO  
Control

When inquiring check CP 7660 on handy form, pgs. 2-3

## INSTRUMENTATION

**Solenoid air valve  
can hit 600 cycles  
per minute . . .**

designed for electrical control  
of small air cylinders

**Uses:** Direct solenoid operated air valves are recommended for very high speed operation — to 600 cycles per minute. They are excellently adapted for electric control of small double-acting air cylinders on short stroke, high speed applications. They can also be used for switching mechanisms on conveyors, and automatic machines.

**Features:** High-speed operation is attained by using only one moving part which is spring-returned.

**Description:** Single-solenoid model has single valve stem and employs spring return. Other models are built where single valve stem remains at either end of stroke until returned by solenoid air. These "momentary contact" valves employ one solenoid at each end of stroke — there is no need to keep solenoid energized to hold valve in position.

Internal passages are as large or larger than the  $\frac{1}{4}$ " pipe for which they are rated. Air flow, in fact, is large enough so that valve can be tapped for  $\frac{3}{8}$ " pipe when specified.

(P-M Series Solenoid Air Valves are products of Hannifin Corp., Dept. CP, 1150 S. Kilbourn Ave., Chicago 24, Ill. . . . check CP 7661, pages 2 and 3.)

## Outlines relays, meters

Manufacturer's line of contact meters and sensitive relays is described and diagrammed in eight-page bulletin. Among circuits outlined are automatic and manual reset, and self-releasing, single and double contact; interlocked load relays; polypoints; components for circuits; assembled controls; and heavy-duty relays.

Bul 112 is issued by Assembly Products, Inc., Dept. CP, Chagrin Falls, Ohio. When inquiring specify CP 7662 on handy form, pages 2 and 3.



**Cut Costs with POWERS**

**No. 11 Self-Operating Temperature Regulators**

**Used by Leaders  
in Industry  
for**

Water Heaters  
Fuel Oil PreHeaters  
Heat Exchangers

Metal Finishing  
Tanks and  
Machines

Metal Parts Washers  
and Degreasers

Bottle and Can  
Washers

Crude Oil Heaters  
and Treaters

Jacket Cooling  
Water  
for Air Compressors

Diesel and Gas  
Engines

Cooking Vats

Dishwashers

**They're Simple  
Easy to Install**

**ACCURATE**

**Give many years  
of Reliable  
Service**

(b57)

**Write for Bull. 329**

**Or Call Our Nearest Office**

**THE POWERS REGULATOR CO.**

Skokie, Ill. • Offices in Over 50 Cities, see your phone book.  
**OVER 60 YEARS OF TEMPERATURE AND HUMIDITY CONTROL**

When inquiring check CP 7663 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Travers  
position

Uses:  
web of  
making  
Features  
weight  
profiles  
Descript  
in illust  
10 to 60  
general  
films an  
models  
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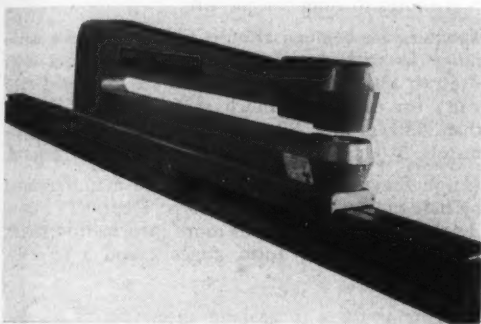
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phia

**Traversing beta gage positioned by servo**

**Uses:** Measures thickness or weight of moving web of material, can be positioned across sheet for making profiles without contact.

**Features:** Servo positioning control makes weight monitoring system more flexible, permits profiles to be run easily.

**Description:** Deep-throated beta ray gage shown in illustration is designed for materials weighing 10 to 600 milligrams per square centimeter. This general range corresponds to tire fabric, plastic films and sheets, paper and boxboard. Other models are available for both heavier and lighter web material.



Sheet-traversing system is controlled by servo positioning device. Graduated dial on control panel permits operator to move source-detector unit to any point across sheet. Accurate profiles can be taken in a few minutes even when source-detector unit is not visible from control panel.

Feature of servo positioning control is its "memory system" which automatically returns source-detector unit to position it was previously measuring if, for any reason, it has been removed from sheet. Accessory equipment permits source-detector unit to be withdrawn from sheet automatically every half hour for standardization. It likewise permits automatic return of detector after it has been standardized.

(Model RTM beta ray gage with servo positioning is built by Industrial Nucleonics Corp., Dept. CP, 1205 Chesapeake Ave., Columbus 12, Ohio . . . or check CP 7664 on handy form, pages 2 and 3.)

**Details recorder with speedy pen travel — 1/2 sec**

Strip-chart recorder which can cross chart and balance in half a second is described in detail in two-page data sheet. Printed in two colors, sheet covers principle, operating characteristics, and so forth. Photos are included.

Data Sheet 10.0-13 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Station 64, Wayne and Windrim Aves., Philadelphia 44, Pa. Specify CP 7665, pages 2 and 3.

# STEAM...is only as good as you use it!

**Use steam the right way to reduce production costs, improve product quality and output—**

**W**hen production slow-downs, high costs, and poor product quality occur, don't always blame the process equipment—often the fault is in the way steam is used.

For example, waterlogging caused by improper trapping or poor steam circulation, seriously affects heat transfer, reduces output, and creates production bottlenecks. Improper air venting does the same. Poor temperature control can lower product quality, cause rejects and further raise production costs.

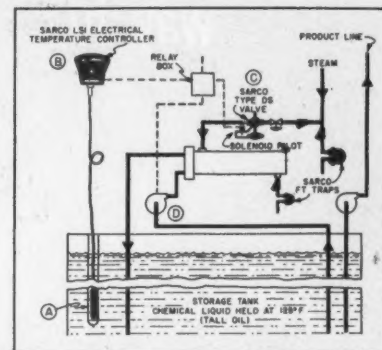
If your plant is suffering from any of these production handicaps, Sarco can help you.

Plant after plant has benefited from Sarco's experience in the process industries. The complete line of Sarco steam traps and temperature controls enables Sarco engineers to offer impartial, expert recommendations on how to make steam work best in your plant.

Why not call on Sarco for engineering recommendations next time you need help. For case histories describing how other plants in your field solved similar problems, write today to Sarco Company, Inc., Empire State Building, New York 1, N.Y.

## SARCO

*improves product quality and output*



### Making Tall Oil Behave

A nationally-known detergent manufacturer uses tall oil in one of its products. Stored in tanks and pumped to vats on upper floors, the liquid must be kept at 125°F to avoid damage to pumps and heat exchanger.

Until recently, the liquid was heated by an exchanger using hand control of the steam valve. This proved costly since it was almost impossible to keep the liquid at the desired temperature.

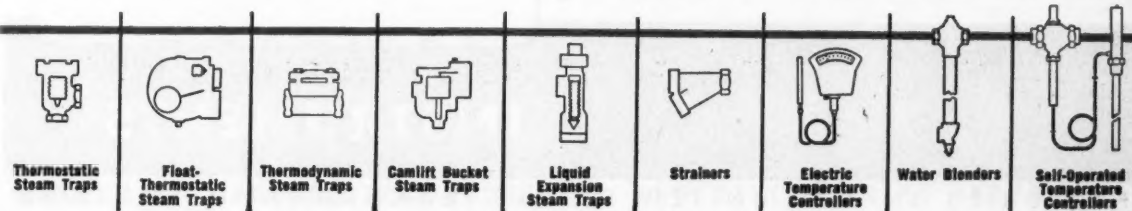
Sarco suggested the installation above. The Electric Temperature Controller (B) opens steam valve (C) and simultaneously starts pump (D) whenever temperature drops below 125°F.

**Result:** shutdowns eliminated, product quality improved . . . another example of how Sarco engineering know-how helped solve a temperature control problem by proper use of steam. Write for Case History 119.

SARCO ELECTRIC TEMPERATURE CONTROLLER holds liquids to  $\pm 1^\circ\text{F}$ . Temperature setting may be easily changed by turning one small knob. Write for Bulletin 1025-A.



### STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



When inquiring check CP 7666 on handy form, pgs. 2-3



Amazingly simple  
way to



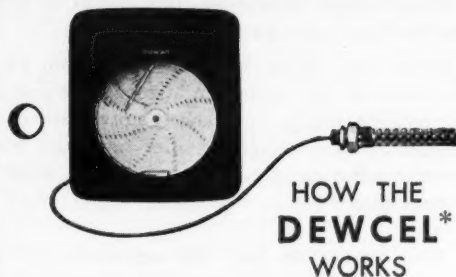
**directly . . . accurately . . . continuously**

Now you can measure or control the humidity content of air or process gases with simplicity and accuracy never before obtainable!

An entirely new-type humidity-sensitive element, the exclusive Foxboro Dewcel\*, opens many new possibilities for product improvement in industry. Coupled with a Foxboro Recorder or Controller, the Dewcel offers these outstanding advantages:

1. Direct recording in dew point temperature, at existing pressure.
2. Wide working range — even operates at sub-zero temperatures.
3. Neither adds nor removes water from atmosphere.
4. No water box or circulation of air required.
5. Simplicity that eliminates maintenance.
6. Sustained accuracy within 1°F. to 2°F.
7. Initial and operating economy.

Investigate Foxboro Dew Point Control for your process. In successful use in nuclear fission, pharmaceutical, food and chemical plants, distilleries, photo film production, drying and storage operations. Write for Bulletin 407. The Foxboro Company, 814 Neponset Ave., Foxboro, Mass., U.S.A.



The Dewcel element is a thermometer bulb (liquid-filled or electric-resistance type) jacketed with lithium-chloride-impregnated woven glass tape. Over this are wound two spaced wires connected to an AC source. The lithium chloride absorbs moisture, allowing current to flow, generating heat, and raising the temperature. Equilibrium temperature is reached when vapor-pressure of the moist salt exactly balances that of the surrounding air or gas. The System translates this temperature into direct readings of dew point.

Thus, Foxboro Dew Point Instruments give direct readings or control of dew point from -50°F. to 142°F. at working temperatures from -40°F. to 220°F. Readings easily converted to absolute or relative humidity.

\*Trade Mark

## INSTRUMENTS

FACTORIES IN THE UNITED STATES CANADA, AND ENGLAND

When inquiring check CP 7667 on handy form, pgs. 2-3

## INSTRUMENTATION

### Fast pressure changes measured with SR-4

**Uses:** Rapid pressure changes are now measurable with bonded electric strain gage cells.

**Features:** Five standard capacities are 1000, 2000, 5000, 10,000, and 20,000 psi. Other capacities are available.

**Description:** Cells consist of pressure sensitive tube on which SR-4 strain gages are bonded. Temperature changes may be measured with electrical indicator or recorder, but oscilloscopes or oscillographs are usually used for high frequency work. Upper frequency response is usually limited by cavity resonance of tank or piping connected to pressure cell. Ruggedly built cells have high accuracy and sensitivity. Absence of moving parts contributes to long fatigue life.

Temperature compensation is provided over a wide range — with static pressure measurements it is -60 to 150°F. Higher voltages are also used (25 volt) for outputs as much as 50 per cent greater than conventional SR-4 gages. Cells are approximately 5 1/2 x 2" diam. They weigh one pound.

(High Frequency Pressure Cells are manufactured by Baldwin-Lima-Hamilton Corp., Dept. CP, Philadelphia 42, Pa. . . or for more information check CP 7668 on handy form, pages 2 and 3.)

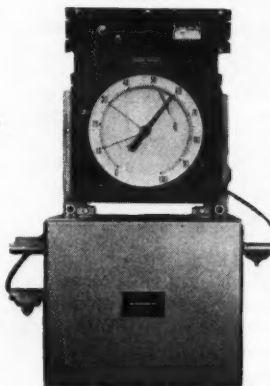
### Infrared analysis record for plant streams of liquid . . .

more than a dozen two-component systems have given practical results with instrument

**Uses:** Standard plant stream analyzer has been adapted for analyzing a variety of liquid streams for various components.

**Features:** Only difference in liquid analyzer from gas analyzer is design of cells for sample, filter-compensator, and interference. Liquid cells are designed to provide shorter path lengths and are fitted with capillary tubes for filling and sample flow.

**Description:** As in gas analyzer, infrared absorption in characteristic band is used to make continuous record of quantity of unknown present. Sample cells for liquid are constructed with calcium fluoride, barium fluoride, or quartz discs separated by lead or stainless steel spacers. Spacers are adjusted for proper path length. Discs are clamped to stainless steel plates serving as mounting fixtures for completed



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(Therm  
CP, 218  
CP 767

## INSTRUMENTATION

cell. Capillary stainless steel tubing is soldered in the plates to line up with drill holes of the discs. These liquid cells are completely interchangeable with gas cells of the analyzer unit.

Normal operation calls for thermostating to 150°F for stable operation. It is important to keep cells clear of gas bubbles since spurious readings are incurred when they are present. In some cases this entails degassing sample.

Plant operation or laboratory tests have confirmed that the following systems can be satisfactorily handled by analyzer:

Component measured continuously	Concentration (range/full scale recorder deflection)	Remaining components in sample
Water	0-10 or 0-100 ppm	CCl <sub>4</sub>
Water	0-400 ppm	Benzene
Water	0-1 or 0-20%	Methyl ethyl ketone
Water	0-5 or 40-55%	Methanol or ethanol
Water	0-5.0 or 0-100%	Isopropanol
Formaldehyde	35-37%	Water
Monochlor benzene	0-10%	Ortho dichlorobenzene
Acetic acid	0-20 or 0-50%	Benzene
Acetic acid	0-1 or 0-100%	Acetic anhydride
Toluene	0-10%	Benzene
Propylene dichloride	0-10%	Ethylene dichloride
Cyclohexanol	0-1%	Cyclohexanone
Paraxylene	0-100%	other xylene isomers, ethylbenzene, toluene, etc.

(Liquid Plant Stream Analyzer is a development of Baird Associates, Inc., Dept. CP, 33 University Rd., Cambridge 38, Mass. . . . check CP 7669, pages 2 & 3.)

### Cuts gas flow to chlorinator to prevent formation of unsafe liquid . . .

formation of liquid chlorine forestalled by using precision thermostat

**Uses:** To shut off chlorine gas supply when gas temperature drops below a specified limit.

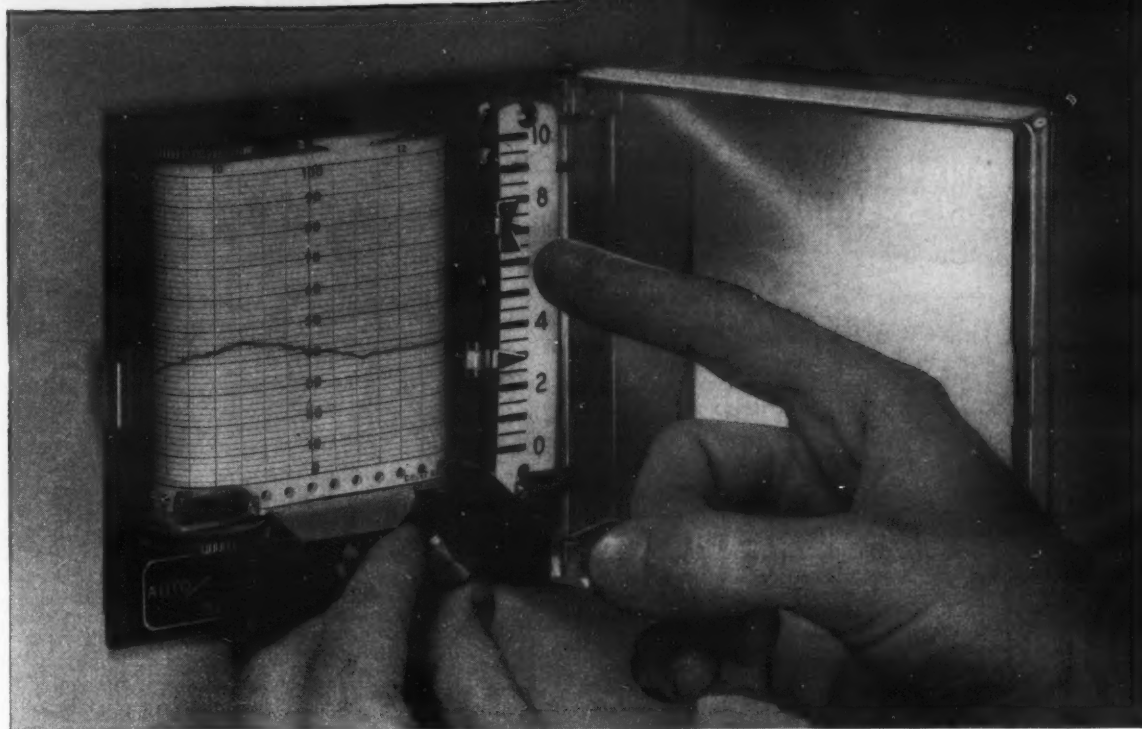
**Features:** Thermostat is sealed off from direct contact with the highly corrosive chlorine gas.

**Description:** Temperature-sensitive shell of thermostat is mounted directly in gas line between vacuum regulator and chlorine rate valve. One side of standard pipe thread on coupling head is inserted into a corrosion resistant Uscolite adapter while the other side is connected to explosion-proof fitting.

With the chlorine gas normally at 60°F, thermostat is adjusted so that its electrical contacts open at 25°F. To stop flow of gas, a solenoid air pilot valve in thermostat circuit closes air-operated valve in the line between chlorine supply tanks and the chlorinator. At the same time signals light on auxiliary panel.

(Thermostat is a product of Fenwal Inc., Dept. CP, 218 Pleasant St., Ashland, Mass. . . . check CP 7670 on handy form, pages 2 and 3.)

## WHAT'S NEW AT BRISTOL . . .



BRISTOL'S "HUMAN-ENGINEERED" METAGRAPHIC RECORDER, with its easy-to-read scale, high-visibility fluorescent pointers and shadow-proof door has earned the distinction of being the "biggest little instrument in the business."

## Instrument men call Bristol's METAGRAPHIC Recorder "... the biggest little instrument"

Sounds contradictory, but it's true. Take a look at one of our new METAGRAPHICS mounted on a panel board alongside of other instruments. The Bristol unit stands out — seems bigger than the rest — although chances are it's actually smaller (5" x 5½"). The answer is that the Bristol instruments have been "human-engineered", making them easy to read, and clearly visible at greater distances.

The air-operated METAGRAPHIC, which records pressure, temperature, vacuum, flow, differential pressure, and liquid level, offers these big advantages:

**SIMPLICITY** . . . fewer moving parts, fewer adjustments, and less service required. Range changes can be made in seconds. True plug-in service.

**CONTINUOUS VALVE-POSITION INDICATION** . . . on same instrument scale as set-point scale, gives continuous data on control valve position—makes "bumpless" transfer possible simply by matching pointer positions — no need to read actual scale values — minimizes reading errors — speeds operations.

**CONTINUOUS OPERATION** . . . complete unit can be retracted for inking pen, and for set-point and zero adjustment without disturbing record or control.

Get the whole story on the "human-engineered" METAGRAPHICS — how they can help you get more accurate measurements, faster and easier. Write us today. The Bristol Company. 141 Bristol Road, Waterbury 20, Conn.

# BRISTOL

POINTS THE WAY IN  
HUMAN-ENGINEERED INSTRUMENTATION

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 7671 on handy form, pgs. 2-3



# MERIAM MANOMETER ACCURACY... Inverted Manometry For Liquid Systems Only

• Meriam Inverted U-Type and Well-Type Manometers for indicating flow at low cost in liquid processing offer these outstanding advantages.

- 1) Highest sensitivity of rate of flow and broad range of continuous indication.
- 2) Self-compensating for density changes.
- 3) The liquid being processed is diverted through these manometers and becomes the indicating fluid. This unique feature eliminates all possibility of contamination of the process liquid by another indicating fluid.

If you have problems involving flow indication, talk to your Meriam Technical Representative, or write us today. The Meriam Instrument Company has been supplying primary standards for indicating pressure or flow of liquids and gases for more than forty years. We are glad to share our experience with you.

INVERTED  
U-TYPE

## THE MERIAM INSTRUMENT CO.

10940 Madison Avenue • Cleveland 2, Ohio  
WESTERN DIVISION: 4760 E. OLYMPIC BLVD., LOS ANGELES 22, CALIF.  
IN CANADA: PEACOCK BROS., LTD., MONTREAL

INVERTED WELL-TYPE

**MERIAM** ★  
★ *Instruments*  
ESTABLISHED 1911

MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT  
OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

When inquiring check CP 7672 on handy form, pgs. 2-3

## INSTRUMENTATION

### Portable atomic rig checks level in tanks

**Uses:** Portable instrument can be used for finding level of all sorts of materials in tanks or bins. It is also frequently used for checking readings obtained by conventional level instruments.

**Features:** Detector unit is easy to carry, weighs only six pounds. Shielded radiation source in master unit weighs 18 pounds.

**Description:** Radiation source consists of a small amount of radium salt inside lead-shielded container. Radiation can be emitted in one direction only and level makes it safe for one man to use this source for eight hours a day. Portable instrument — placed on opposite side of vessel being checked — determines when level reaches predetermined point. When detector and source are raised in unison, marked increase in radiation is noted in master unit meter when level of material in the tank is reached. Instrument can also be used to detect interface level between petroleum and water or sludge in tank bottom.

(Densitron Level Indicator is manufactured by Instruments, Inc., Dept. CP, 122 N. Madison, Tulsa 22, Okla. . . or for more information check CP 7673 on handy form, pages 2 and 3.)

### Temp, pressure figuring made easy

Manufacturer's temperature-vapor pressure conversion calculator employs plastic-bound cardboard sliderule for easy figuring. Pressure (in psi) can be quickly calculated for Freon F<sub>12</sub>, Freon F<sub>22</sub>, CH<sub>3</sub>Cl, ammonia, and sulfur dioxide by adjusting sliding panel to desired temp, reading indicated figure in appropriate window.

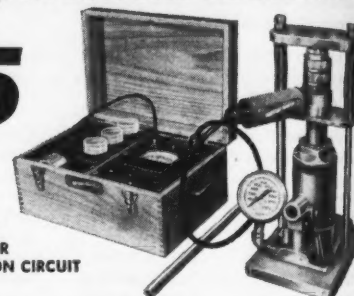
Temperature-Pressure Conversion Calculator is available from the Hubbell Corp., Dept. CP, Hawley Road, Mundelein, Ill. When inquiring reader may simply specify CP 7674 on the convenient Reader Service slip located between pages two and three.

# A 1 MINUTE MOISTURE CHECK

INSURES QUALITY OF PRODUCT  
WHEN YOU USE THE  
**NEW MOISTURE REGISTER**

**G5**

EXCLUSIVE  
R. F. POWER  
ABSORPTION CIRCUIT



PROVED IN THE FIELD ON

**SUGARS**

**STARCHES**

**FLOURS**

**CITRUS PULPS**

**SOAPS**

**DRIED EGGS**

**FEEDS**

**POWDERED CHEMICALS**

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**BAKING MIXES**

**MEALS**

**FERTILIZERS**

Send Coupon TODAY!

**ELECTRONIC  
MOISTURE REGISTER**

Moisture Register  
testing equipment  
is the standard in moisture  
testing for all industries.

1510 W. Chestnut St., Alhambra, California, Dept. CP

Please send me complete information on MODEL G5  
MOISTURE REGISTER. I want to test \_\_\_\_\_ (MATERIAL)

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_ ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 7675 on handy form, pgs. 2-3

CHEMICAL PROCESSING

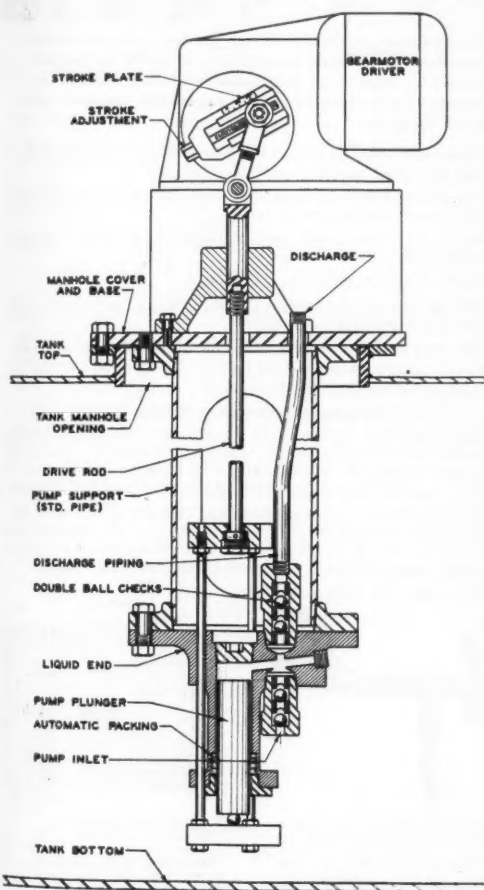
**Pump 400 gallons an hour  
at 1000 psi pressures  
without leaks . . .**

controlled volume pump operates with "leakable" end submerged in liquid being pumped

**Uses:** For controlled volume pumping at high pressures and rates from 3 milliliters to 400 gallons per hour.

**Features:** Though pressures to 1000 psi can be attained, leaks are no problem because piston and cylinder end of pump operate beneath level of liquid being pumped.

**Description:** Large controlled volume pump can be used as single adjustable element or as final control element in process instrumentation. Plunger



stroke can be adjusted with a maximum of 3". Plunger diameters range from 7/16 to 2". Overall height of pump is 52" and can be inserted in a 14" diameter manhole. Either electric or pneumatic drives can be used.

(Mersemetric Controlled Volume Pump is a development of Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . or for more information check CP 7676 on handy form, pages 2 and 3.)

## How would YOU solve these two problems?



**1. MEN AND WOMEN BOTH** like nylon fabrics. Important key to producing successful nylon fabrics is the heat-setting process. Temperature-control must be accurate, and reliable yet readily adjustable. "National" Nylon Heat Setting Machines used by the leading textile mills employ THERMOSWITCH® units in the heated rollers . . . get highest efficiency . . . greatest safety . . . most economical fuel consumption.



**2. BABY INCUBATOR MUST BE SAFE.** Engineers who design Armstrong Baby Incubators say "Safety is a must where babies are concerned. That is why all our baby incubators are tested and approved by Underwriters Laboratories. That is why we use only Fenwal THERMOSWITCH units to control all-important temperature and humidity. Inspection reports on more than 22,000 THERMOSWITCH units show a remarkable picture of consistent reliability."



**3. THIS IS IT** — the Fenwal THERMOSWITCH control is simple — compact shell contracts or expands *instantly* with temperature changes, opening or closing electrical contacts. Adjustable and highly resistant to shock and vibration. Fenwal THERMOSWITCH units are solving temperature problems and helping to improve the final product throughout all industry.



**4. SEND FOR THIS BROCHURE** for complete explanation of the unique THERMOSWITCH unit. Also ask for more detailed, illustrated discussions of the problems above. Fenwal engineers will be glad to help you solve your temperature control problems involving heat, humidity, radiant heat, pressure and other variables. Write Fenwal Incorporated, 244 Pleasant St., Ashland, Massachusetts.



**THERMOSWITCH®**

Electric Temperature Control and Detection Devices

**SENSITIVE . . . but only to heat**

When inquiring check CP 7677 on handy form, pgs. 2-3

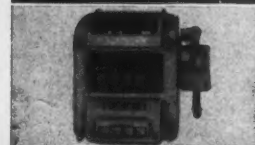


## ✓ Are you saving all you can with Liquid Meters?

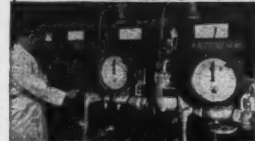
Here's a check-list of savings made every day with accurate metered measurement of more than 150 industrial liquids. Chances are you can use at least five of these ideas in your plant:



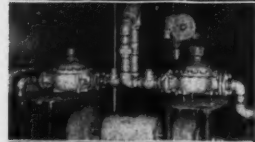
✓ **AUTOMATIC BATCH MIXING:** Meter liquids directly to tanks or kettles with Neptune Auto-Stops. Push buttons to set quantity . . . meter cuts off accurately, automatically. No waiting for weigh tanks to fill, no "inching" up to gauge marks, no wrestling with bags or buckets.



✓ **AUTOMATIC PROCESS CYCLING:** Auto-Stop meters can be equipped with electrical switches to start or stop pumps, agitators, etc. . . . automatically. Saves times, labor, power . . . with closer control.



✓ **ELIMINATE REJECTED BATCHES:** In one leading pharmaceutical plant, Neptune meters eliminated human errors, saved enough costly ingredients to pay for the meters in less than a month! How's your "reject" rate?



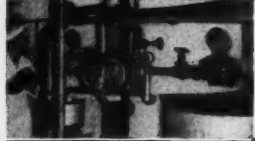
✓ **EASIER INVENTORY, COST CONTROL:** Neptune Meters at key check points keep track of inventory, interdepartmental use, production rates, etc. They put a stop to waste, verify full measure received or delivered.



✓ **AUTOMATIC DRUM FILLING:** This Neptune fills drums, radiators, fuel tanks, etc., with exact quantity every time you press the handle. Saves time, labor, prevents spills or "shorts."



✓ **OIL BURNERS, DIESELS:** Use these low-flow meters instead of bulky day tanks to measure fuel consumed by boilers, melting furnaces, diesels, etc.



✓ **WATER CONDITIONERS:** Trident meter's wary eye tells when ion exchange unit needs recycling. See if yours has trouble-free Trident.



✓ **TANK TRUCK DELIVERIES:** Many industrial liquids can be delivered by metered trucks with greater ease and accuracy than markers, gauges or sticks. Investigate Red Seal meters.



Give you  
any ideas?

TELEPHONE OR  
WRITE NEAREST  
NEPTUNE  
BRANCH OFFICE  
FOR QUICK  
DETAILS—  
Or write for  
Metering Data Book  
566-R P

**NEPTUNE METER COMPANY**  
50 West 50th Street, New York 20, N. Y.

Branches in:

ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER  
NO. KANSAS CITY, MO. • LOS ANGELES • LOUISVILLE  
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In Canada: NEPTUNE METERS LTD., TORONTO 14, ONTARIO



## INSTRUMENTATION

### Draft gage measures directly . . .

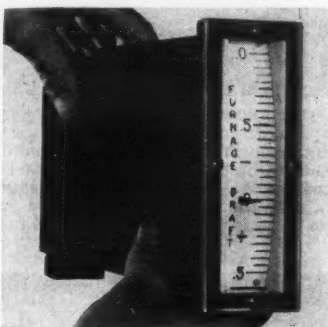
extra transmitters or accessory mechanisms are not necessary

**Uses:** For measuring draft pressure, vacuum, or differential draft.

**Features:** No extra transmitters or accessory mechanisms are needed.

**Description:** Self-contained gage directly measures low furnace and differential pressures.

Full-sized diaphragms or bellows are used with unit. Diaphragm elements are available for pressure ranges as low as 0.6 and as high as 40" of water. Gage may be



used as receiver for pneumatic transmission pressures between 5 and 30 psi. It can also be furnished with two bellows and two pointers for steam flow-air flow or fuel-air indication.

(Bantam Draft Gage is a product of Republic Flow Meters Co., Dept. CP, 2241 Diversey Parkway, Chicago 47, Ill. . . . check CP 7679 on handy form, pages 2 and 3.)

### Technical info offered for equipment design

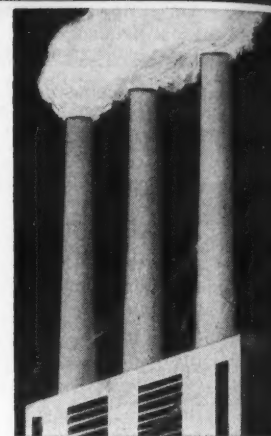
Problems of process equipment design are mathematically analyzed in company's recently-started encyclopedia of technical information.

Articles discussing some mechanical phases of design associated with process work will be forthcoming each month as additions to the book.

"Techlopedia" is issued by Techniflex Corp., Dept. CP, Port Jervis, N.J. When inquiring specify CP 7680, pages 2 and 3.

## AIR POLLUTION

How high  
should a  
smoke stack  
be?



From decades of experimentation general rules have been formulated to establish the behaviour of smoke wastes from chimneys. Meteorological knowledge of time, temperature, humidity and turbulence can be established for your own plant location.

If you have an air pollution problem in your manufacturing process . . .

Before you build or buy that new plant . . . before you modify your present equipment . . .

Better get the latest meteorological facts about your present or future location.

They can save you a lot of money.

Did you know that even the location of your chimney can help control air pollution?

Can you process at night under more favorable conditions? Can you make better use of wind speed and direction to control air pollution?

### Foresighted Company Officials

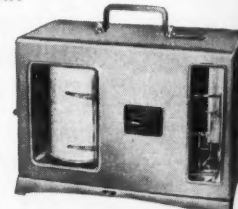
Management, making full use of meteorological conditions above a plant site, can anticipate exactly what will happen to smoke from a stack before a blue print is drawn . . . or a steam shovel digs out the first foundation.

Bendix-Friez . . . the standard of the world for meteorological instruments for 77 years offers you all its facilities to help you find a practical, economical approach to your air pollution problems . . . now or before they start.

Write to the address below.



**AEROVANE** Indicates and records wind speed and direction. Recognized as "best all-purpose wind measuring instrument yet devised." Readily installed and easily maintained.



**HYGRO-THERMOGRAPH** The leader in its field. Noted for precise accuracy and long-time dependability. Portable, easy to operate. Widely used in laboratories, factories and offices.

**FRIEZ INSTRUMENT**  
Division of  
  
AVIATION CORPORATION  
1450 Taylor Ave., Balto. 4, Md.  
EXPORT SALES  
Bendix International Division  
204 E. 42nd St., New York 17, N.Y. U.S.A.

When inquiring check CP 7681 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Record and control refractive index  
in any range with sensitivity  
of 0.0002 to 0.00001 . . .**

optical and electric instrument uses null balance  
for accurate control and measurement

Controlling and recording refractive index instrument consists, in general, of a registering system capable of sensing change of index and presenting change on counter, a telemetering system which conveys change of index to controller, and controller itself which directs final control element for correction.

Liquid under test flows through a hollow prism producing deviation of the image of a slit. At balance, slit image falls on an opaque bar. When refractive index changes from set point, a field of light appears above or below bar. This is sensed by flow multiplier tube and a rotating shutter system. Resulting flicker is amplified as AC. Phase-sensitive circuit detects direction of change from setpoint.

Sensitivity is adjustable. Maximum sensitivity allows instrument a recording and control span of 0.001 refractive index units and each chart division at this sensitivity is equivalent to 0.00001. Where minimum sensitivity is used, range corresponds to 0.02 refractive index units with each chart division equivalent to 0.0002.

Since temperature has a pronounced effect on refractive index, sample is passed through heat exchangers which control temperature to 0.1°C. This allows aqueous solutions a deviation of 0.00001 or hydrocarbons a deviation of 0.00004 or 5 refractive index units. This temperature control is attained only in static systems — continuous measurement poses a more difficult temperature regulating problem.

Prism housing and its associated connecting tubes are stainless. They are designed so that flow system may be cleaned if necessary. Housing for hollow prism is free from other parts of spectrometer. Four bolts at corners of casting permit removal for cleaning.

(Controlled Refractometer has been developed by Bausch & Lomb Optical Co., Dept. CP, Rochester 2, N. Y. . . . or for more information check CP 7682 on handy form, pages 2 and 3.)

**Catalog on pressure gages  
contains 17 sections**

Sectionalized catalog of 124 pages lists manufacturer's complete line of pressure gages, gage accessories, and gage engineering information. Supplemented by photographs, line and dimensional drawings, catalog includes sections on drawn case gages, chemical attachments, chemical gages, special industrial application gages, navy and marine gages, laboratory and pocket test gages, gage testers, mercury column pressure and vacuum gages, barometers, and special gage features.

Ashcroft gage cat is available on letterhead request to Manning, Maxwell & Moore, Inc., Dept. CP, Stratford, Conn.

# NO Reducing Valve Needed

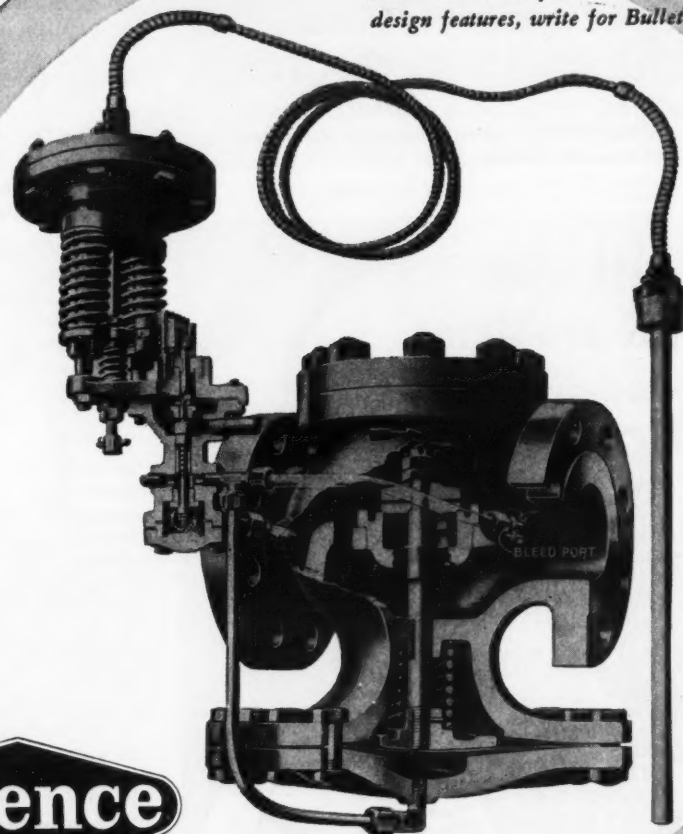
## Here's real economy in temperature control.

Because Spence Temperature Regulators are designed to limit heater steam pressures to an adjustable maximum, the need for a separate reducing valve is completely eliminated.

The Spence Regulator takes steam directly from the boiler or high pressure line, reduces the pressure and regulates the flow as required to maintain a constant temperature output from the heater.

This means one relatively small combination pressure and temperature regulator replaces a reducing valve of the same size and a larger temperature regulator. Practically the entire cost of the large separate temperature regulator is saved. And, the total saving would also include the cost of a 3-valve by-pass along with all labor for installation.

This design feature is just one of the reasons for the thousands of Spence installations throughout American industry. For details of other important design features, write for Bulletin T50.



SPENCE  
TYPE ET150  
Temperature  
Regulator

# Spence

**SPENCE ENGINEERING  
COMPANY, INC.**  
WALDEN, NEW YORK

When inquiring check CP 7683 on handy form, pgs. 2-3



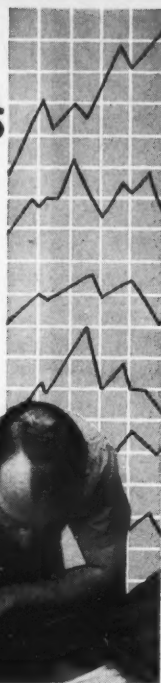
## NOW YOU CAN ORDER PRECISION RECORDING CHARTS MORE EFFICIENTLY!

- Any of 8000 different roll and dial charts available from one source.

Here's a practical service used by over 2000 large and small instrument users. Whatever the makes of instruments in their processes, they receive all their chart needs from Technical.

Your company, too, can experience the same economies in ordering, delivery, stocking and chart costs . . . by ordering from Technical. Chart precision and high quality result from Technical's exclusive specialization in chart making.

Technical provides "Special" Charts for any new instrument or chart idea you have. Complete catalog of services and charts available . . . write today.



# TECHNICAL CHARTS INCORPORATED

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BUFFALO 10, N. Y.

Nationally Represented by TECHNICAL SALES CORPORATION, 16599 Meyers Road  
Detroit 35, Michigan

When inquiring check CP 7684 on handy form, pgs. 2-3

## PROBE into your pH problems on-the-spot

pH readings  
anywhere  
instantly

Price \$125.00  
Instrument size: 3 x 5 1/2 x 2 1/2 inches  
Case size: 3 1/4 x 6 1/2 x 4 1/4 inches  
Weight with accessories: 3 lbs.

Completely  
self-contained in  
water-proof,  
over-ready case

**ANALYTICAL MEASUREMENTS  
INCORPORATED**  
585 MAIN ST. CHATHAM, N. J.

NAME .....  
ADDRESS .....  
CITY ..... STATE .....

When inquiring check CP 7685 on handy form, pgs. 2-3

## INSTRUMENTATION

**Eliminates costly delays  
by having pre-heated  
processes ready . . .**

time switch turns electrical  
appliances on and off

**Uses:** For turning electrical  
appliances on and off automatical-  
ly at preset times every day.

**Features:** Completely portable  
unit can be plugged in anywhere.

**Description:** Unit eliminates  
time lost by employees in prepar-  
ing working material or tools that  
require heating before use. Omit-  
ting device allows it to skip non-  
working days. As many devices  
as desired, up to the 1650 watt  
capacity of the unit may be con-  
trolled. Timer operates on AC  
and is 5 x 5 x 3 1/2" in size.

(Tork 919 is a product of the  
Tork Clock Co., Inc., Dept. CP,  
100 Grove St., Mount Vernon,  
N. Y. . . . check CP 7686 on  
handy form, pages 2 and 3.)

## Make tensile tests at controlled temp

Materials such as rubber, plastics,  
and adhesives can be tested for  
usual mechanical properties at con-  
trolled temperatures. Possible range  
of tests are those which can be made  
on conventional testing machine —  
tensile strength, elongation, break-  
ing point, compression, transverse  
or shear.

In order to make these tests, a  
conventional testing machine was  
equipped with an electrically  
heated cabinet. Indicating py-  
rometer checks temperature. Spec-  
imens are placed inside cabinet,  
ends passing through narrow slits  
at top and bottom. These are  
secured by gripping fixtures on  
outside.

Capacities from 0-250 to 0-10,000  
lb can be obtained either by hand  
or with a motor. A further modi-  
fication (with water or other cool-  
ing agents) can be used to adapt  
the machine for cold temperature  
tests.

(Controlled temperature tester was  
built around a Model L Universal  
Testing Machine manufactured by  
W. C. Dillon & Co., Inc., Dept.  
CP, P. O. Box 3008, Van Nuys,  
Calif. . . . or for more information  
check CP 7687, pages 2 and 3.)

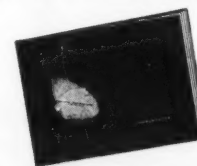
## Quality Control at BRISTOL-MYERS



## expedited by TelAutograph\*

At the enlarged facilities of the Bristol-Myers  
Company plant at Hillside, N. J., the TelAuto-  
graph Telescriber System plays a vital role in  
quality control. Many widely separated depart-  
ments in the enlarged plant must wait for the  
laboratory approval of new batches of tooth-  
paste. When laboratory chemists ascertain that  
rigid quality standards have been met, approval  
is flashed in the chemist's own handwriting by  
TelAutograph telescriber to all departments  
concerned. Instantly and simultaneously the  
handwritten message appears on TelAutograph  
telescriber receiving units throughout the plant.

TIME IS SAVED. STEPS ARE SAVED. MONEY IS SAVED.  
ERRORS ARE AVOIDED BECAUSE MESSAGES ARE WRITTEN.  
NOT VERBAL.



Write for efficiency-producing  
information on Quality Control,  
Handling Incoming Materials,  
Maintenance Control and other  
subjects in the free 16-page bro-  
chure "The Nerve System is  
Communications".

Write Dept. CP-44.

## TelAutograph CORPORATION

16 WEST 61st STREET  
NEW YORK 23, N. Y.

\*Trade mark registered

When inquiring check CP 7688 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Plots from punched cards,  
or from manual feed  
from keyboard . . .**

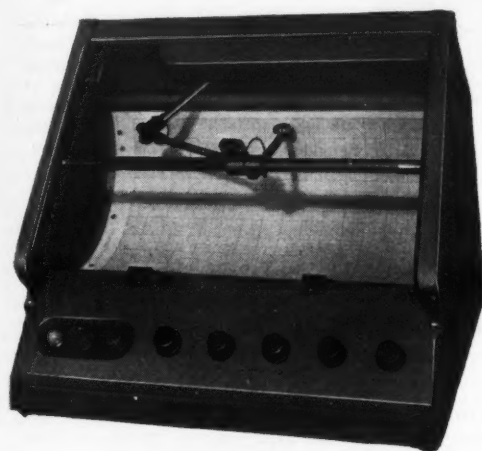
both positive and negative values accepted for plot, accurate to  $\pm 0.1\%$

**Uses:** Portable plotting instrument will handle continuous curves or discreet points. It is useful for display of digital information, can also be used for calibration equipment such as flow meters, etc.

**Features:** Accepting both positive and negative values within its range, recorder produces plot accurate to  $\pm 0.1\%$  of full scale.

**Description:** Designed for desk use or for rack mounting, unit is 16 x 19 x 16 1/4" deep. It is self-contained and is constructed without moving cables, tapes, or lead screws.

Plotting surface is a stationary concave 120° cylinder and takes either 11 x 16 1/2" or 8 1/2 x 11"



Designed for desk or panel mounting

standard graph paper. Paper is held down by magnetic clips. Ink supply is easily accessible and colors can be changed quickly.

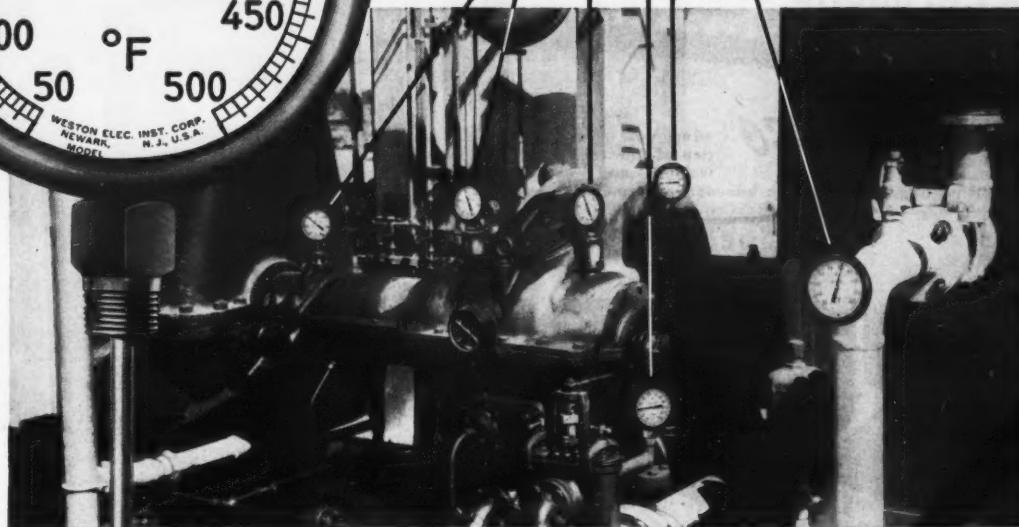
Controls located on front panels consist of dials for off, standby, and 4-quad. Four-quad operation accepts either negative or positive values on both axes. Origin may also be shifted to any part of chart. Zero offset and scale expansion of both axes are continuously variable over 10 to 1 range. Switch control directs pen to either trace or plot point by point. Unit operates on 150 watts, 115 volts, 60 psi.

Accessories are available. Card converter, decimal keyboard unit, analog for digital inputs, or polar coordinates input can be obtained. Decimal keyboard is usually used for manual point plotting.

(X-Y Plotter has been developed by Librascope, Inc., Dept. CP, 1607 Flower St., Glendale, Calif. . . . or for more information concerning manufacturer's product, reader may simply check CP 7689 on the convenient Reader Service slip located between pages 2 and 3.)



**AT EVERY  
CHECKPOINT**

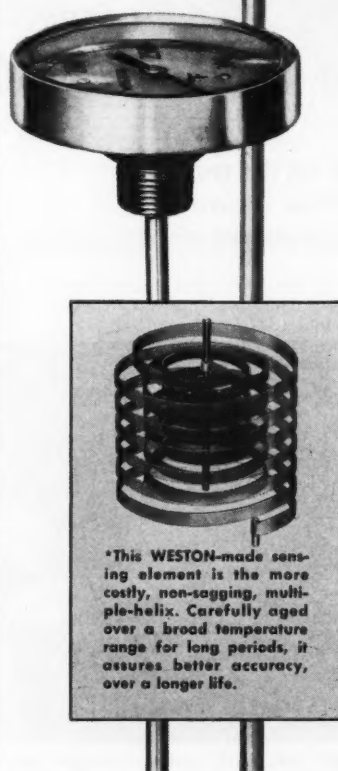


## WESTON all-metal THERMOMETERS

(with Multiple Helix\*)

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.



\*This WESTON-made sensing element is the more costly, non-sagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

**WESTON**  
5537  
*Thermometers*

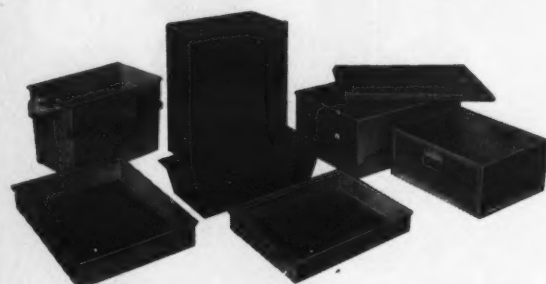
Stocked  
by leading  
Distributors

When inquiring check CP 7690 on handy form, pgs. 2-3

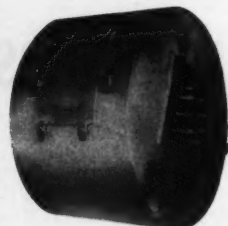


For *Expert Fabrication*  
of **METAL EQUIPMENT** for  
**CHEMICAL PROCESSING**

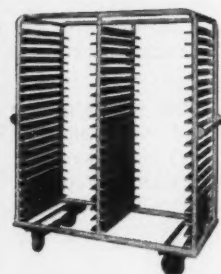
**— Glasco** offers you a rare combination of fabricating facilities, trained and experienced craftsmanship, and thorough knowledge of metal characteristics in any chemical processing equipment you may require.



Trays and Tote Boxes.



Tumbling Barrels.



Tray Drying Racks.

Write for free folder "Metal Equipment for Processing of Chemicals and Pharmaceuticals".

**GLASCO EQUIPMENT CORP.**

*Pioneer Fabricators of Stainless Steel Equipment*

10 WAIT STREET

PATERSON 4, N. J.



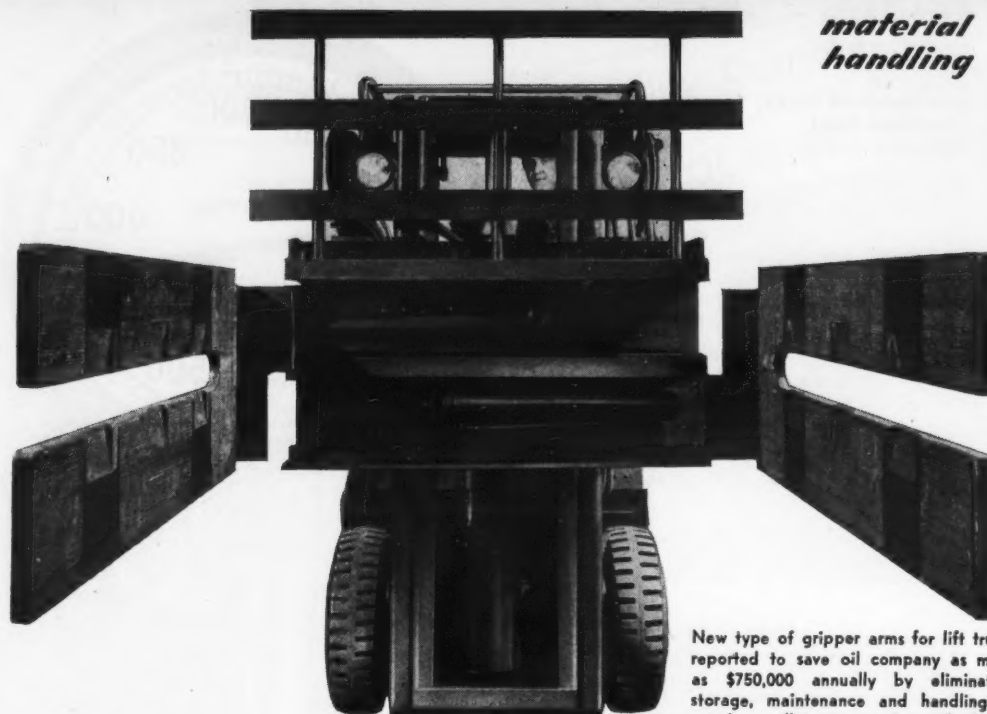
Phila. Area:  
Morgle Organization  
1200 Commercial Trust Bldg.  
Philadelphia 2, Pa.

South: Henry M. Hershey Co., 44 Norwood Place, Greenville, So. Car.  
New England: Harris & Underhill, 446 Stotter Bldg., Boston, Mass.

New York State:  
Sonders Industrial Equip. Co.  
1351 Broadway  
Albany 4, N. Y.

When inquiring check CP 7691 on handy form, pgs. 2-3

*material  
handling*



New type of gripper arms for lift trucks reported to save oil company as much as \$750,000 annually by eliminating storage, maintenance and handling of wooden pallets in moving oil drums. Thinness of arms permits close-stacking of loads for more efficient use of warehouse and shipping space

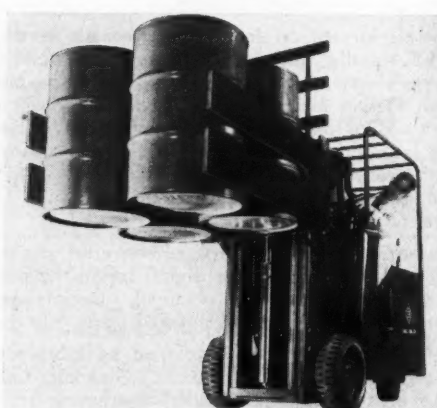
*Eliminating wooden pallets saves labor,  
space and \$250,000-\$750,000 annually*

**Gripper arms on lift truck  
hold steel drums securely  
— even during abrupt stops**

By use of gripper arms on lift trucks, one of the country's largest oil and refinery products producers has greatly simplified its handling, transporting and storing of thousands of steel drums. Annual savings from the new method are estimated between \$250,000 and \$750,000.



With gripper arm attachment, operator arranges four oil drums preparatory to picking them up and transporting them as they are needed



Four oil drums are held aloft by lift truck equipped with new gripper arm attachment. Heavy loads are handled safely without crushing

Developed primarily to cut the company's distribution expenses by eliminating use of wooden pallets, the new handling method differs from conventional fork lift truck operations in that gripper arms grasp loads from the sides.

During an initial study of its distribution problem, the company felt that palletless handling was preferred, but ensuing tests proved existing gripper arms unsatisfactory for several reasons. Not only did they have to be changed for different types of loads, but the thickness of the arms necessitated leaving large gaps between loads, thereby wasting warehouse and freight space. With the new set of arms, both drums and packages can be handled. Further, the arms are flexible and are shaped to provide a sufficiently firm grip to hold loads safely, despite abrupt stops.

Up to nearly two tons can be handled by the largest type of attachment which can also take four 50-gal drums or the equivalent in cases, quarter-drums, kegs and pails.

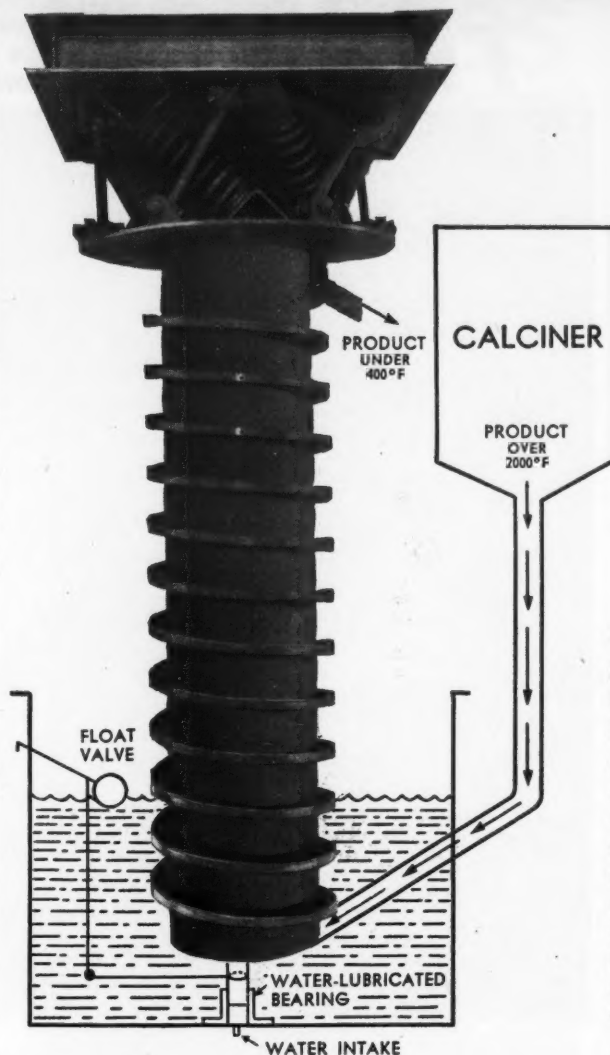
Friction, uniformly distributed over a relatively large area, rather than localized pressure, provides the main force with which the loads are lifted. This improvement allows handling of larger loads without crushing. Lifting effectiveness of the friction factor is raised by special shaping of arms, plus corrugated facings where they come into contact with a load.

In its earlier phases, the company's development project also produced an attachment for lifting two 55-gal drums or their equal in cases and quarter-drums, and another for lifting one 55-gal drum or its equal in cases.

(The new attachment for handling drums and packages was developed by the Shell Oil Company and was constructed by Elwell-Parker Electric Co., Dept. CP, Cleveland, Ohio. Check CP 7692, pages two and three.)



Drums on their sides can be handled equally well as upright loads with recently developed gripper arms. Arms are shaped to grip loads firmly, in spite of abrupt stops



The Natural-Frequency principle is always used in Carrier Conveyors and other Vibrating Equipment. It accounts for the magic Carrier formula:

**LOW HORSEPOWER means LOW OPERATING STRESS**  
**LOW OPERATING STRESS means LOW MAINTENANCE**  
**LOW MAINTENANCE means EFFICIENT, UNINTERRUPTED PRODUCTION**

## HERE'S DEPENDABLE HEAT-TREATING AND QUENCHING!

This 8-ft. high "spiral ramp" is a Carrier Natural-Frequency Vibrating Conveyor — especially designed for uniform, dependable, continuous quenching on hot chemical catalysts.

See how it works. The chemicals leave the calciner at over 2000°F. and are transferred three feet under water onto the bottom spiral of the conveyor. The materials are then agitated and vibrated upward, *uniformly*. They reach the top two minutes later, completely dry, at 400°F. The materials move at a constant speed. The operator can control the discharge temperature *exactly*, by adjusting the float switch to provide either more or less immersion time.

The unit is stainless steel throughout, is powered by a 3/4 H.P. drive, and has a capacity of 2400 lbs. per hour. It's been "on the job" for over two and a half years — has paid for itself many times over in lowered maintenance costs and increased production!

What are your heat-treating or quenching problems? If they're at all similar — or if they involve bleaching, washing or any other operation where an agitated condition between materials and liquid must be uniformly maintained, Carrier Natural-Frequency equipment will do a better job — *and save you money, to boot!* Write Carrier Conveyor Corporation, Frankfort Avenue at Clifton, Louisville 6, Kentucky.

## CARRIER NATURAL-FREQUENCY CONVEYORS

Frankfort Avenue at Clifton, Louisville 6, Ky.

When inquiring check CP 7693 on handy form, pgs. 2-3



## MATERIAL HANDLING

### Bulk sulfuric acid handling system cuts handling, boosts production at Eli Lilly and Company . . .

15,000 gal storage tank and pipe line distribution system permit quantity purchases

Handling sulfuric acid by bulk handling system instead of batch methods is reported to have cut previous costs in half at Eli Lilly and Company's Indianapolis pharmaceutical plant. In addition, production gains from 1 to 20% (depending upon specific reaction) have been made with no additional personnel.

Acid cost is less because bulk deliveries can now be made. Tank trucks unload 2600 gal of 66°Be  $H_2SO_4$  into 15,000 gal storage tank. Compressed air at 20 psig is used to force acid from truck into tank. In-plant handling costs are reduced since acid is pumped to major distributing points instead of being transported in carboys as done previously.

Acid storage tank is constructed of black iron and is not lined. As a precaution in case of leakage or rupture, tank is set at ground level in a concrete dike 15' wide, 35' long, 5' deep. Drain at bottom of dike is plugged except when flushing. Handle of pipe plug extends 3" above top level of dike wall. Tank is vented to atmosphere by 2½" pipe leading to sump filled with crushed limestone. A shed covers the tank.

Acid is pumped to five dispensing stations by means of a submerged verticle centrifugal pump. Pump, a Taber C2, is powered by 5 hp motor, delivers 15 gpm of acid at 32 ft head. Pump is operated at dispensing points and storage tank. At dispensing point, acid flows into measuring tank before being drawn off for reaction. Each outlet is equipped with goose-neck to trap line.

Piping is 2" welded extra heavy black iron. Acid valves are flanged and have all iron bodies, polyethylene diaphragms. Flanges are welded and protected with polyethylene snap-on safety covers.

As a precaution, slope of pipe lines allows acid to drain by gravity towards storage tank. Safety showers are located at storage tank and at the individual measuring tanks. Electrical system is explosion proof.

(Material for the article was furnished by Eli Lilly and Co., Dept. CP, 230 E. McCarty, Indianapolis 6, Indiana.)

### Cylindrical loads can be lowered from one floor to another without power . . .

counterweight-piston action acts as cushion during fall; rate can be controlled

**Uses:** For lowering cylindrical loads from one floor to another. Typical loads include drums, barrels, rolls of rubber, paper, etc.

**Features:** Principal advantages listed are: (1) no power is required for operation, (2) there is no problem of slowing down and stopping load

# THE LOWEST PRICED LO

# NEW



## The new LEADER in LOADERS—only \$3395.<sup>00</sup>

**Here it is**—the new 12-cubic foot, Model 20 Baker-Lull SHOVELoader—the ideal *low-cost* answer to mechanization of bulk material handling.

Shovel loader Model 20 actually costs less than a year's pay for a laborer with a hand shovel! The low price is made possible by utilizing a mass-produced "power package"—including engine, transmission and drive axle. This saving to us is reflected in the extremely low selling price, *without sacrificing quality*.

**Model 20** is designed and engineered for fast, efficient large volume performance. Although priced \$350 or more under any other loader in its class, we ask that you compare it with the highest priced—using any standards you wish.

**Compare its construction** of highest quality materials and components. Compare its proven,

dependable power unit, made for us by a leading builder of gasoline tractor engines.

**Compare it for performance.** Compare its 7-foot lifting height and 1500-lb. load carrying capacity with other makes. Compare it for speed: top travel speed 14 mph. Compare the natural and easily controlled bucket action for efficiency in digging, loading and carrying.

**Compare for operator safety and convenience.** Operator has full 360° visibility at all times. Moving bucket arms are always *in front* of him, instead of moving up and down beside him where they obstruct vision and are a constant hazard to life and limb.

**Compare for versatility.** Model 20 Shovel loader gives you top bulk handling efficiency for light materials, heavy loads or loads varying from light to heavy. It easily switches to lift forks, special buckets or crane hook attachments to perform many other jobs in your plant.

# ED LOADER IN ITS CLASS

## Baker-Lull model 20 SHOVELoader



**UNLOADS BOXCARS:** The maneuverability of Shovel loader Model 20 makes it ideal for unloading bulk materials such as foundry sand, dry chemicals, fertilizers, etc., from box cars with 6-foot doors.



**HANDLES COAL:** Shovel loader Model 20 saves many man hours in coal handling operations. Full hydraulic control of bucket means safe operation in close quarters.

### THE BAKER-LULL CORPORATION

*Formerly the Lull Corporation*

315 WEST 90th ST. • MINNEAPOLIS 20, MINN.  
*A Subsidiary of The Baker-Raulang Company*



**BETTER DIGGING ACTION:** Tiltback of bucket at ground level of 15° and automatic scooping action as lift arms are raised, provide the natural, easy digging and full-bucket operation that pays off in more work per hour.



**LIFTS HIGHER—DUMPS HIGHER:** Model 20 Shovel loader's 7-foot lifting height permits charging of high hoppers and better use of bin space by higher piling. Loading out scrap and loading high truck bodies is no problem.



**LIFTS 1500 POUNDS EASILY:** Lifting and carrying capacity of  $\frac{3}{4}$  tons of material is about 500 pounds higher than most loaders in this class. Greater forward reach—full 48 inches ahead of front tires—means better positioning of loads in truck loading and piling.

.....

THE BAKER-LULL CORPORATION,  
315 West 90th Street • Minneapolis 20, Minn.  
Please send full information on the Baker-Lull, Model 20,  
12 cu. ft. SHOVELoader which sells for only \$3395.00.

NAME.....

COMPANY.....

ADDRESS.....

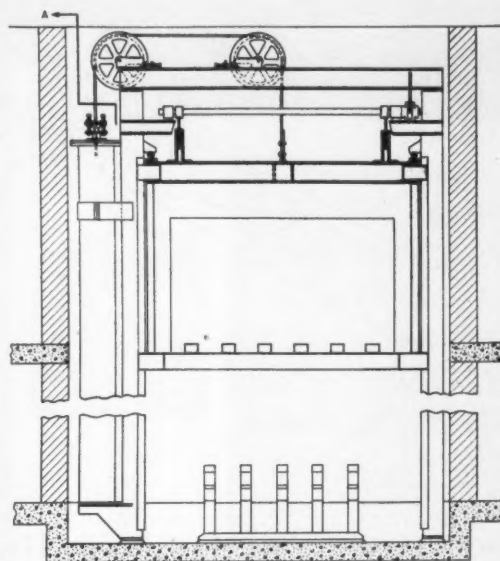
CITY.....STATE.....

When inquiring check CP 7694 on handy form, pgs. 2-3

## MATERIAL HANDLING

as in the case of inclined chutes, and (3) maintenance is minimized.

**Description:** Powerless Drop is installed in a shaftway, operates on counterweight principle. In operation, load is rolled onto carriage, release lever is pulled, and load descends to floor below.



No power is required

Piston-like counterweight housed in a cylinder cushions the fall. As counterweight rises it forces air through needle valve opening at top of cylinder. Energy expended in forcing air through opening controls motion of counterweight and carriage.

Needle valve openings may be regulated to control rate of ascent or descent. Carriage guides ride along replaceable plates mounted along sides of I-beams which form framework of the unit.

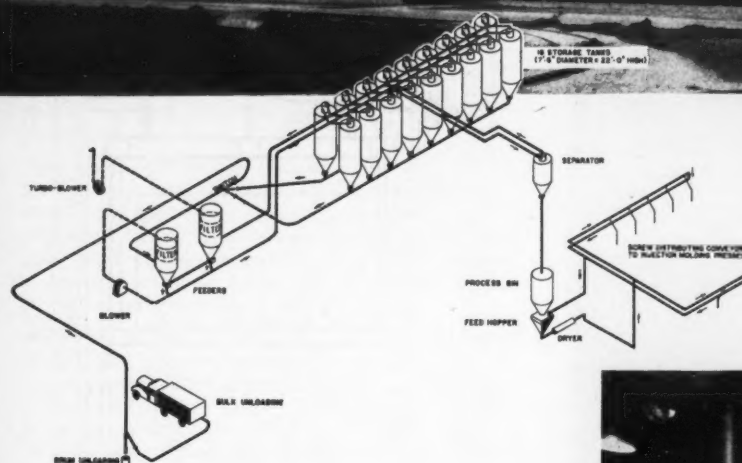
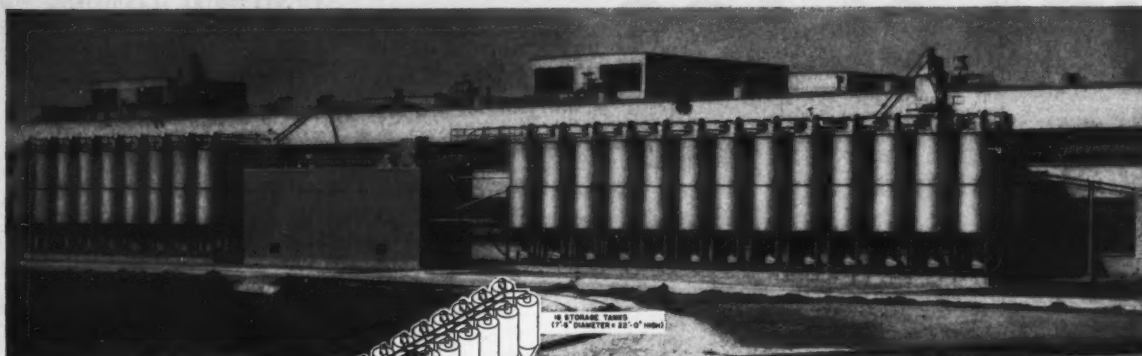
(Developed by the Gifford-Wood Co., Dept. CP, 23 Hill St., Hudson, N. Y. . . . or for more information check CP 7695 on handy Reader Service slip, pages 2 and 3.)

### Features of belt conveyor shown with charts, photos

Four-page illustrated folder shows applications and features of manufacturer's portable belt conveyor units. With photos and descriptions of typical uses, bulletin also presents specifications in chart and table form. Sketches and photos are used to show recommended installation procedures and to point out each part of the unit.

Bul SJA-53 is issued by The Rapids-Standard Co., Inc., Dept. CP, Grand Rapids, Mich. When inquiring specify CP 7696 on handy Reader Service slip, pages 2 and 3.)





Storage and Airveyor handling system of unit shown on left of photo above. The same system is installed in unit on right, except for storage capacity.

## Granular plastics handling with speed and safety by **AIRVEYOR**

Western Electric Company, after much study and investigation, selected the Airveyor for handling granular plastics at its Indianapolis plant, for many sound reasons, some of which are:

1. Adaptable to turns and long runs.
2. Ability to handle dusty materials with relatively clean pick up; also ease of cleaning out the system.
3. Non-existence of explosion hazards when handling plastic materials.
4. Dust-tight and weather-tight construction.

This all adds up to convenience in placing conveying ducts—vertically, horizontally, overhead, around corners—from unloading to storage, from storage to process. Seals dust in, contamination out. Prevents explosions, avoids respiratory hazards. Cleanliness all along the route, without spillage, to multiple points of storage and use.

The Indianapolis plant handles up to 10,000 lb. of granular plastics an hour. The Airveyor system of ducts extends approximately 400 feet.

If you handle dry pulverized or granular materials, it will pay you to investigate the Airveyor, for better conveying, at less cost, and without contamination.

**FULLER COMPANY, Catasauqua, Pa.**

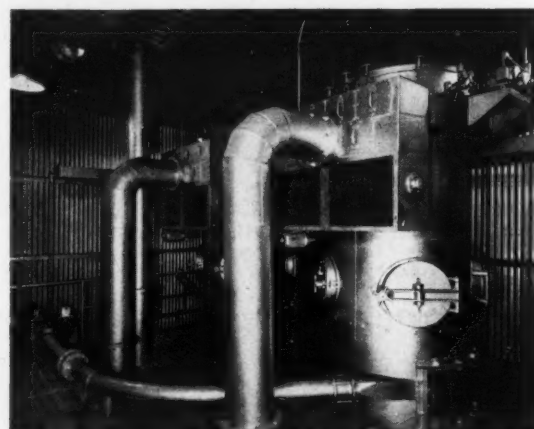
Branch Offices

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

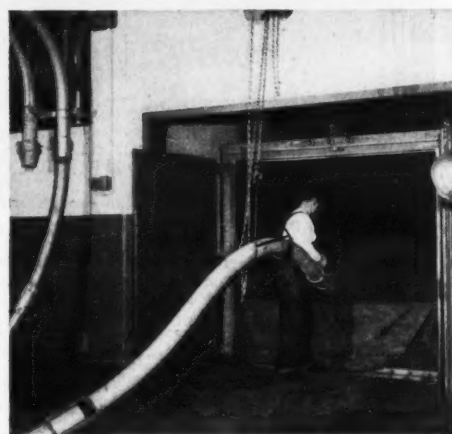
# Fuller

26 YEARS' EXPERIENCE IN PNEUMATIC CONVEYING

When inquiring check CP 7697 on handy form, pgs. 2-3



Four compartment, continuous Airveyor filters



Bulk unloading from truck, using the Airveyor

## MATERIAL HANDLING

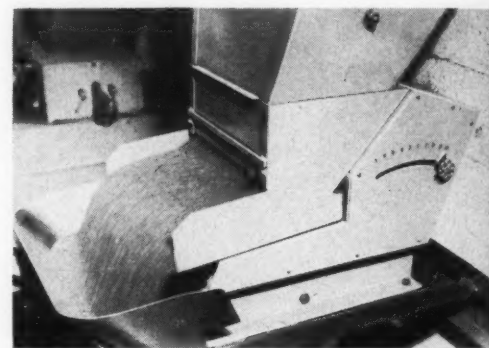
**Continuous feeding with high output accomplished with minimum power input . . .**

vibration kept at near-resonant frequencies; 1/8 hp motor does heavy duty

**Uses:** For continuous feeding to grinding mills, pulverizers, roasters, mixers, conveyors, elevators, package machinery and for general process feeding. Also suited to automatic scales for uniform flow.

**Features:** High output with negligible power (since vibration occurs at near resonant frequencies) is main feature claimed by manufacturer.

**Description:** With power requirements of 1/8 hp motor, equivalent to a 100 watt bulb, capacity of Velofeeder ranges from 300 to 60,000 lb/hr on 50



1/8 hp motor powers vibrating feeder

lb/ft<sup>2</sup> of material such as grain, or from 0.1 to 20 cfm. Unit measures only 28" long, 17" wide, 19" high, and has angle of feed of 5° down from horizontal.

Uphill feed is possible at somewhat decreased outputs; thus feeder is self-emptying. Feed rate is continuously variable from near zero to 50 fpm maximum. Operating frequency listed at 1850 vibrations per min. No lubrication is required except for the 1/8 hp motor and drive. Mounting is secured through four bolts through integral mounting base.

(Licensed manufacturer of Velofeeder described is Richardson Scale Co., Dept. CP, Clifton, N. J. . . or check CP 7698 on the convenient Reader Service slip located between pages 2 and 3.)

## Gives specs on conveyor belts for hot materials

Bulletin describes and illustrates construction of belts for hot materials. Belts are made with rayon fabric, cord and glass fabric reinforcement. Details recommended services for each type of belting.

Bul 2400 is available from B. F. Goodrich Co., Dept. CP, 448 S. Main St., Akron, Ohio. When inquiring specify CP 7699 on handy form, pages two and three.

## MATERIAL HANDLING

### Processing continues as pressure feeder moves material

**Uses:** To feed bulk materials into and out of pressure of vacuum systems without stopping the processing operation.

**Features:** Feeder will continuously move materials from high vacuum to atmospheric pressure or feed at atmospheric to compressions as high as 10,000 psi.

**Description:** Mechanically operated feeder moves material by gravity or mechanical means through an intermediate lock from one pressure to another. Balance ports equalize pressure between the several adjacent sections making it possible to feed unprocessed material into production, while moving the processed material along.

Opening of gates and chokes is automatic and when mechanically closed, gates are locked and sealed against loss of pressure or vacuum. Flow is continuous and no material ever rests on the sealed surfaces. Fabrication of the feeder is from either stainless or carbon steel.

(Feeder is product of John T. Collins & Co., Dept. CP, 21 Maple St., Summit, N. J. . . . or for more information check CP 7700 on handy form, pages 2 and 3.)

### Powered scoop's highlights reviewed in bulletin

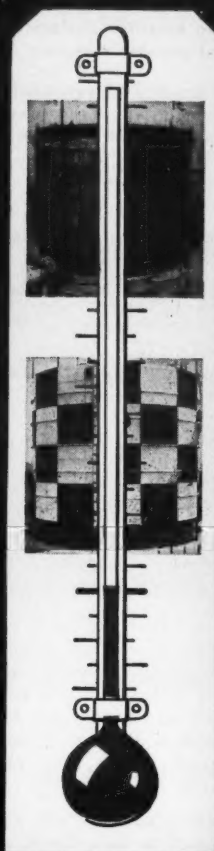
Automatic Power Scoop designed for one-man operation in unloading bulk material from boxcars is described in manufacturer's bulletin. Features of scoop, including a "dead-man" switch lever located on handle grip, free-wheeling clutch, are listed.

Bul #863 is issued by the Jeffrey Mfg. Co., Dept. CP, 956 N. Fourth St., Columbus 16, Ohio. When inquiring specify CP 7701 on handy form, pages 2 and 3.

For more information on product at right, specify CP 7702 . . . see information request blank between pages 2 - 3.



## from the ARCTIC to the TROPICS



more than  
**130**

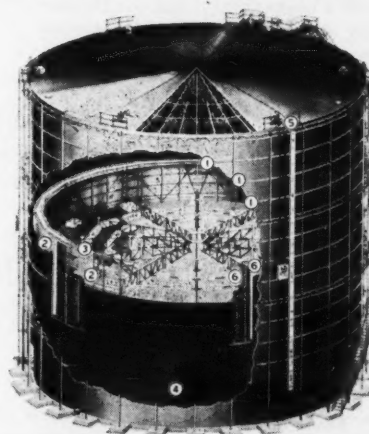
WIGGINS  
GASHOLDERS  
have eliminated  
operating costs  
for users of  
chemical process  
and industrial  
gases



This 100% dry seal gasholder (no water, no tar, no grease) has proved itself under every condition of climate and temperature. Because of the seal and the simple operating mechanism, operating costs have been entirely eliminated. Comparison of maintenance expense by owners of Wiggins gasholders also shows remarkable savings. Companies who have converted old-type gasholders to the Wiggins advantages have been able to enjoy similar savings. Write for information.

PISTON RISES NEARLY TO TOP—MINIMUM OF WASTE SPACE  
CAN BE BUILT ANY SIZE • NO CONTAMINATION OF GAS

1. Space above piston completely ventilated
2. Wide clearances simplify operation.
3. Gas-tight frictionless seal not affected by weather.
4. Piston rests on bottom when empty—less than 1/4 of 1% dead space for purging.
5. Leveling device—dependent of side wall—keeps piston level.
6. Fenders prevent all tension in seal.



**General American Transportation Corporation**  
135 SOUTH LA SALLE STREET • CHICAGO 90, ILLINOIS

Offices in Principal Cities

Export Dept.: 380 Madison Avenue, New York 17, N. Y.  
Plants: Birmingham Ala. • East Chicago, Ind. • Sharon, Pa.  
In Canada: Toronto Iron Works, Ltd., Toronto, Ontario

by  
**GENERAL  
AMERICAN**





# MORRIS Type "R" SLURRY PUMP



*Cuts*

## Stuffing Box Maintenance...

Fluctuating Sealing Water Pressure Is No Problem when you install a Morris Type R Slurry Pump. Even when peak demand on the plant supply line lowers the pressure, this pump operates with minimum stuffing box wear. Only 10% normal sealing water pressure is actually required... because Morris Type R stuffing box is subject to suction pressures only. Low line pressure is therefore sufficient to shut out grit effectively... and still protect the slurry from objectionable dilution.

If no other Type R feature were listed, here's one that says: Specify Morris. But there's even a bigger story. Ask for further information on this outstanding slurry pump, servicing scores of material handling applications.

### OTHER MORRIS TYPE R FEATURES

- ✓ EASY TO INSTALL
- ✓ EASY TO DISMANTLE
- ✓ EASY TO MAINTAIN
- ✓ SIMPLEST DESIGN
- ✓ MINIMUM NUMBER OF WEARING PARTS

*Specify* **MORRIS Type "R"  
SLURRY PUMP**

MORRIS MACHINE WORKS  
Baldwinsville, N. Y.  
Branch Offices in Principal Cities

**MORRIS** Centrifugal Pumps

When inquiring check CP 7703 on handy form, pgs. 2-3

### MATERIAL HANDLING

**Dock board unit requires  
no counter balances  
or power devices**

Designed for permanent installation on concrete docks, magnesium dock board units are easily raised or lowered by one man. No power operated devices or counter bal-



Easily handled by one man

ances are required. Recessed type of dock installation permits unit to self-adjust to truck level. Safety curb is designed to prevent power-truck wheels from colliding with curb rail.

(Perma-Docks are a product of Magline Inc., Dept. CP, Pinconning, Mich. . . . or for more information check CP 7704 on handy Reader Service slip which is located between pages 2 and 3.)

**Fills, checkweighs, releases  
up to 8 bags per min  
automatically . . .**

accuracy is kept within 1-2 oz tolerance

**Uses:** For production bag filling and weighing of granular, flake, pellet or fibrous materials.

**Features:** Unit handles up to 8 bags per min of any desired weight from 25-200 lb within weight tolerances of 1 or 2 ounces.

Model shown is a gross weighing scale used in direct filling of open-mouth bags, drums or cartons.

**Description:** Feeder and bag holder of Model 1000G require 20" headroom. Scale and feeder are 2 x 4 x 3' high. Material

**CONSULT FOR THE BEST**

**PS Materials HANDLING EQUIPMENT**

**Item B-426 \$6720**

**STOCK CHECKER'S TRUCK**

Designed to handle a large variety of items or parts. Three steel shelves with 1" flanges all around. Floor clearance 9 1/2". Overall height to top shelf 42 1/2". Top of table 50". 44" long, 20" wide. All steel welded construction. Semi-crated approx. 190 lbs.

**Item C-491**

**Sloped Bottom BOX and STAND**

**Item B-416**

**BARREL CRADLE**

**Item S-987 \$11550**

**Heavy Duty WAREHOUSE TRUCK**

Use anywhere heavy loads are moved and rubber tired wheels are desired. 54" long, 28" wide, 42" high at handle. Top of platform 14" off floor. Welded construction. Heavy 7/8" plate. Two swivel wheels at handle end. Approx. wt. 300 lbs.

**Item B-529**

**All metal PALLET**

**Item C-488**

**Automatic END DUMP**

**Item NS-415R**

**UTILITIES RACK**

on wheels  
Item NS-415M \$6775 (Roller bearing, 6" x 2", all-metal wheels).

**Item NS-415R \$7020**

(Ball bearing, 8" x 1 1/2", rubber-tired wheels).

**Item NS-364**

**SHEET STEEL GRAB**

**Item B-700**

**CORRUGATED BOX with legs**

**Item S-708**

**Industrial DUST PAN**

**Item S-911**

**BARREL TRUCK**

loads automatically

**Item NS-298 \$5115**

**HAND DUMP TRUCK**

Reinforced heavy sheet steel, 1/2 cubic yard, capacity—two 8" semi-steel wheels and two 4" metal swivel casters. Wt. 125 lbs.

**WHEN ORDERING** always give "item" number. All PRICES are f.o.b. Detroit. Prices are subject to change without notice.

**DESIGNED AND MANUFACTURED BY**

**Palmer Shile Co.**

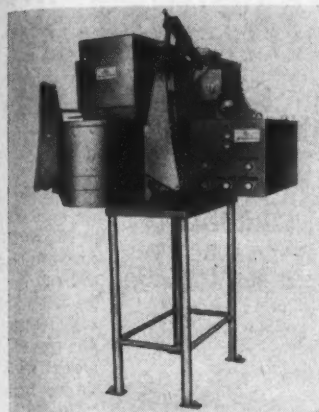
16016 FULLERTON AVE., DETROIT 27, MICH.

Write for catalog.

When inquiring check CP 7705 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING



Keeps weight tolerances to within 1 or 2 oz

feeder may be attached directly to storage bin or surge hopper fed by gravity or by conveyor system. Variation in head pressure has little or no effect on scale accuracy since material is conveyed through feeder at right angles to gravity flow. Adjustments allow differences in material density due to changes in formulation or batch mixes to be compensated for in a few seconds.

Shock-proof leverage system of scale mechanism operates without knife-edge pivots to retain original sensitivity and accuracy. Unit may be furnished with a wide choice of bag holders, depending upon characteristics of material being handled. Casters and locking screws may be furnished so that scale may be moved from one filling station to another.

Incorporating most of the features found in Model 1000 G a faster model (1000N) is a net weighing scale and faster operating unit since weigh hopper can be refilled while container for material is being positioned or removed. An automatic bag joggler may be attached as an integral part of Model 1000N.

(Developed by Thayer Scale & Engineering Corp., Dept. CP, 492 E. Water St., Rockland, Mass. . . . or check CP 7706 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 7707 . . . see information request blank between pages 2 - 3.

# Here's Why The **MICHIGAN** Tractor Shovel WILL DO MORE WORK FOR YOU!



*\* This Power Train — from engine to tires — engineered and manufactured by Clark*

**\* CLARK TORQUE CONVERTER** — 3-to-1 multiplication factor provides maximum torque when it is needed. Precise control in inching and digging.

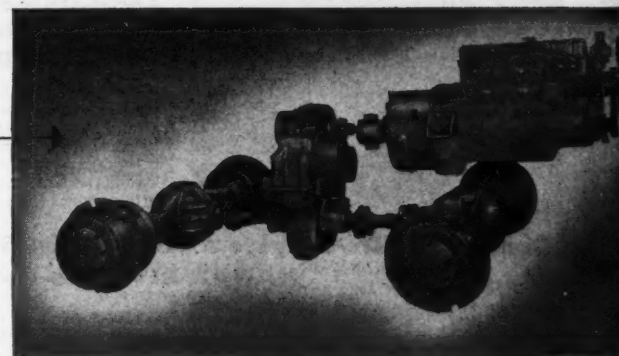
**\* CLARK POWER-SHIFT TRANSMISSION** — no conventional clutch; four speeds forward and reverse—direction control by lever on the steering column.

**\* CLARK PLANETARY DRIVE AXLE** — final reduction in the wheel reduces the torque load on all gears and shafts.

**RESULT** — easier operation, utmost accessibility and simplicity of servicing, highest efficiency in shovel handling.

ADD greater weight and more horsepower than any front-end loaders of comparable capacity, and you see why you can Move More with a MICHIGAN\*.

\*A Trademark of Clark Equipment Company



For full information send for the MICHIGAN Tractor Shovel Fact-Folio — specifications, action photos, magazine article. The coupon will bring your copy.

**CLARK  
EQUIPMENT**

**CLARK EQUIPMENT COMPANY, Construction Machinery Division**  
434 Second Street, Benton Harbor, Michigan, U. S. A.

Please send the MICHIGAN Tractor-Shovel Fact-Folio

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_



When You Want Conveyor  
**EXPERIENCE**  
... Check with **STANDARD CONVEYOR**



## Keep Merchandise Moving with Roller or Belt Conveyor

• With an experience record of more than 45 years—Standard is known as headquarters for any "package" conveyor need—can help you to handle packages, parts, units—faster—at lower cost with gravity or power roller, belt, slat, chain, wheel or pushbar conveyors. For complete information write Dept. CP-44.



## Load-Unload • Stack • Elevate with a HANDPILOT

• Handles sacks, boxes, cases, cartons, bundles—conveys up or down. Built in 14 and 24 inch widths; boom is designed to pile cartons up to 17 ft.—sacks to 12 ft.—projects into cars, trucks, trailers. Handles commodities up to 135 lbs. Write Dept. CP-44 for Bulletin 63-D.

## Build Your Own System with Standard HANDIDRIVE Pre-Built Units...



**STANDARD CONVEYOR COMPANY**  
General Offices: North St. Paul 9, Minnesota  
Sales and Service in Principal Cities

• Handidrive belt, live roller and gravity roller conveyors consist of drive and take up units, and roller assemblies, intermediate framework, supports and hanger, to make complete conveyors—or to convert present gravity conveyors to power conveyors. Write for Bulletin 63-D, address Dept. CP-44.

Send for Bulletin 63-D,  
describing the above  
and other Standard Con-  
veyor equipment. Ad-  
dress Dept. CP-44



**Standard**  
GRAVITY & POWER  
CONVEYORS

ROLLER • BELT • SLAT • CHAIN • WHEEL  
PUSH-BAR • SECTIONAL  
PORTABLE CONVEYOR UNITS:  
HANDIBELT • HANDIPILER  
INCLINEBELT • LEVEL BELT • EXTENDOVER  
UTILITY BELT-VEYOR • HANDI-DRIVE  
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

When inquiring check CP 7708 on handy form, pgs. 2-3

## MATERIAL HANDLING

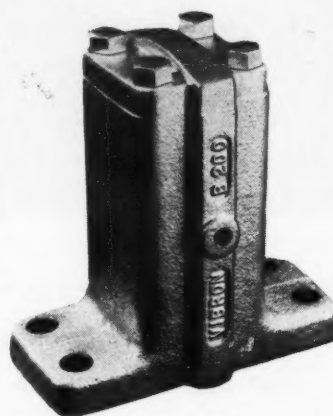
**Non-impacting feature lets vibrator work quietly...**

compressed air principle eliminates broken bolts, end plates

**Uses:** To speed flow of inert bulk materials and help reduce processing time from bins, chutes, hoppers and screens.

**Features:** Quiet action, non-impacting operation are features listed for heavy-duty vibrators designed to prevent arching, clogging or sticking of materials.

**Description:** Using compressed air, automatic cycle of vibrator produces as many as 5000 vibrations per min. Supercharging



Vibrates with practically no noise

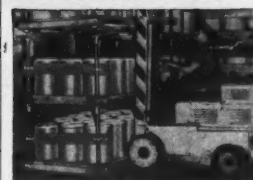
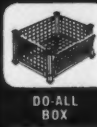
design increases effect of operating air pressure from 30 to 60% above supply pressure, resulting in 110% bonus vibration power output, manufacturer reports. Design also prevents destructive metal-to-metal pounding, broken bolts and end plates.

Cast alloy bodies have hard-chromed and precision-ground pistons. Vibrators are available in wide range of sizes with capacities to move bulk materials up to 30 tons. Units can be supplied with mounting plates or special mounts can be fabricated.

(Developed by Vibron Div., Burgess-Sterbentz Corp., Dept. CP, 3790 W. 150th St., Cleveland 11, Ohio... or for more information concerning manufacturer's product, reader may simply check CP 7709 on handy Reader Service slip which is located between pages two and three.)

LET US SHOW YOU HOW TO  
**CUT WAREHOUSING COSTS... as much as**

**Paltier 75%**  
**STORAGE SYSTEM**



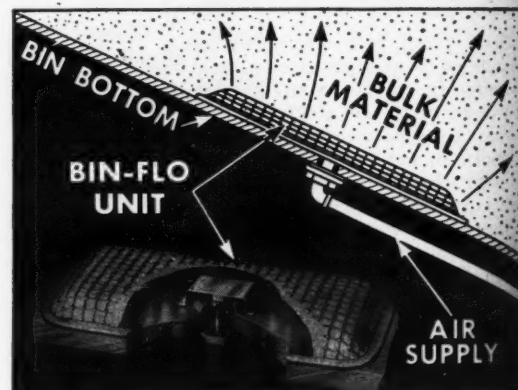
### ASK US:

- PALTIER studies your storage problem—engineers and designs a system for your specific needs.
- Many PALTIER installations pay for themselves "right from the start."
- This booklet tells the PALTIER story, ask for it today.

PALTIER records are filled with proof after proof of storage cost cuts in the handling of every conceivable type of product. We can cut your storage costs, too!

**THE PALTIER CORPORATION**  
1713 KENTUCKY ST.  
MICHIGAN CITY, IND.

When inquiring check CP 7710 on handy form, pgs. 2-3



**BIN-FLO** USES SMALL VOLUME OF AIR AT LOW PRESSURE  
**KEEPS BULK MATERIALS MOVING**

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR bin level indicator—"The Eyes of the Bin"—automatically reports levels of materials in storage; automatically controls filling machines; prevents waste.

**THE BIN-DICATOR CO.**

13946-D Kercheval • Detroit 15, Mich.

**NEW**  
**20-PAGE**  
**BOOK**  
**FREE**

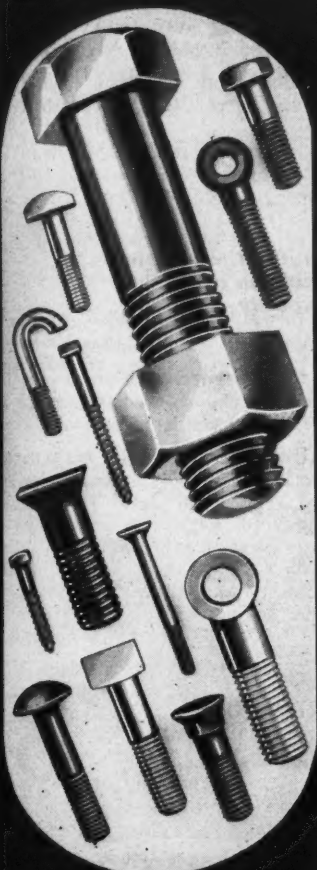
When inquiring check CP 7711 on handy form, pgs. 2-3

CHEMICAL PROCESSING

UNIFORM CLASS 3 FIT

## BOLTS-NUTS STUDS

- Carbon Steel
- Silicon Bronze
- Alloy Steels
- Naval Brass
- Stainless Steel
- Monel Metal



You can depend on a uniform Class 3 fit when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

BETTER BOLTS SINCE 1882

# PAWTUCKET

"THE BOLT MAN"  
MANUFACTURING COMPANY

327 Pine Street - Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

When inquiring check CP 7712  
on handy form, pgs. 2-3

## MATERIAL HANDLING

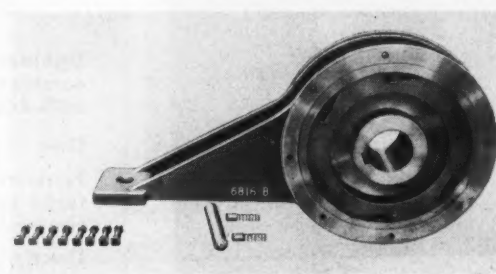
**Bucket elevators, inclined conveyors  
won't back up if power fails  
when loaded . . .**

hold-back with torque resistance of 350,000  
inch-lb releases when forward motion resumes

**Uses:** To prevent reversal of bucket elevators and  
inclined conveyors due to power failure under load.

**Features:** Having maximum torque resistance up  
to 350,000 inch pounds for units with a maximum  
bore of 7", hold-back releases instantly when forward  
motion of shaft is resumed.

**Description:** Mounted directly on drive-shaft of  
bucket elevator or inclined conveyor, hold-back consists  
of an inner member with wedge pockets for six  
hardened rollers which rotate with the shaft. When



Stops backward movement of bucket and inclined  
elevators

shaft attempts to reverse, due to power failure, rollers  
wedge against an outer cylinder. Pressure springs  
and plungers guarantee instant engagement of rollers.  
Torque arm of hold-back is bolted to a support with  
sufficient strength to resist load exerted when reversal  
occurs.

(Enclosed roller hold-back is a product of Standard  
Products Div., Stephens-Adamson Mfg. Co., Dept.  
CP, Aurora, Ill. . . or for more information check  
CP 7713 on handy form, pages 2 and 3.)

### Near-resonant features outlined for vibrating feeder

A new vibrating feeder that operates at near-  
resonant frequencies is pictured and described  
in manufacturer's latest data sheet. Feeder is  
reported capable of turning out from 0.1 to 20  
cu ft of product per min.

Data Sheet suggests uses, lists specifications,  
gives a detailed explanation of operating principles.  
In addition to capacities and dimensions,  
literature lists materials that feeder handles,  
notes power requirements, discusses angle of  
feed, and gives information on feeder rate,  
operating frequency, lubrication and mounting.

Data Sheet #5302 describing Vibrating Feeder  
is issued by Richardson Scale Co., Dept. CP,  
Van Houten Ave., Clifton, N. J. When in-  
quiring specify CP 7714 on handy form, pages  
two and three.



## Babying Your Products is the Special Talent of Gaylord Boxes

Gaylord Boxes cradle your product in *safety* from  
packing line to the end of the trip.

This positive protection is a natural result of  
Gaylord's specialized approach to container  
engineering. Successful experience and tireless  
ingenuity combine to produce quality boxes that  
are exactly suited to your particular packing needs.

Many of America's leading manufacturers have  
learned to depend on Gaylord Boxes. How about  
you? For information and cooperation, phone  
your nearby Gaylord office. It's listed in  
your phone book.

## Gaylord Container Corporation

GENERAL OFFICES  
SAINT LOUIS, MO.

SALES OFFICES  
COAST-TO-COAST



CORRUGATED AND SOLID FIBRE BOXES • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS • FOLDING CARTON



## MATERIAL HANDLING

### Data on automatic conveyors outlined in 20-page manufacturer's catalog

Twenty-page catalog describes and illustrates all types of manufacturer's conveyors for automatic, continuous removal of metal-working chips, scale, sludge, cracklings, powders, grain, etc. Booklet features standard types of chains, flights, casings and other components; contains easy-to-read capacity charts, circuit layout suggestions, helpful installation and operating instructions. Briefs of case histories are also included.

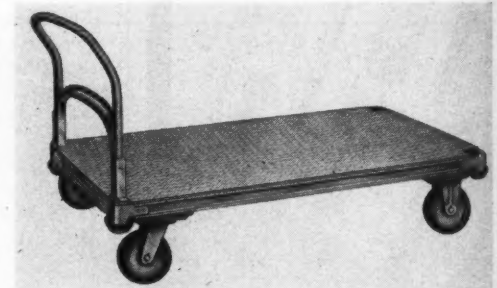
Cat 803 is available on letterhead request to Honan-Crane Corp., Dept. CP, 224 Wabash Ave., Lebanon, Ind.

### Lightness, strength of magnesium combined in platform truck with 1000 lb capacity

**Uses:** For general materials handling.

**Features:** Made of magnesium, each of ten different models offered weigh  $\frac{1}{4}$  to  $\frac{1}{3}$  as much as comparable equipment of similar size.

**Description:** All trucks in the series are capacity rated to handle loads up to 1000 lb, are 4-wheeled and have standard, replaceable parts. Handles are



Can handle loads up to 1000 lb

reversible and may be installed at either end of the platform. They are also interchangeable and can be replaced with special racks or superstructures for multi-purpose truck use.

(Development of Magline, Inc., Dept. CP, Pinconning, Mich. . . . check CP 7716, pages 2 and 3.)

### Shows line of steel standpipes

Booklet of 24 pages illustrates steel reservoir standpipe installations from 50,000 gal to 10,000,000 gal capacity.

Bul "Horton Steel Reservoirs and Standpipes" is available from Chicago Bridge & Iron Co., Dept. CP, 332 S. Michigan Ave., Chicago 4, Ill. When inquiring specify CP 7717, pages 2 and 3.

## The worm that turns ...with ever-increasing efficiency

**Baker Industrial! Trucks use worm gearing in their drive axles, and here's why:**

Industrial truck drive systems are called on for punishing, heavy-duty service. Truck operation is comparable to driving an overloaded auto constantly in low gear. Industrial truck transmissions change speed or direction as often as 1800 times during an eight-hour day.

The necessary gear reduction from motor shaft to drive wheels can be accomplished in several ways. The two most common are a gear train of two or more steps with spur or bevel gears, or single-step worm gearing.

The first means more moving parts, more maintenance, and compounded friction losses for each successive step-down. Development of the highly

efficient involute worms, new lubricants and new tooth profiles, on the other hand, produce worm gearing efficiencies up to 92%—with fewer components.

One more point: Worm gearing actually increases efficiency with wear since the worm continuously regenerates the "ideal" tooth profile on the worm wheel. In spur or bevel gearing, efficiency declines progressively as teeth wear and lost motion develops.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book—Bulletin 64. The BAKER-RAULANG Company, 1208 West 80th Street, Cleveland 2, Ohio.

**Baker.**  
industrial trucks

When inquiring check CP 7715 on handy form, pgs. 2-3

**Describes complete line of bin level indicators**

Catalog illustrates and describes line of pressure-actuated bin level indicators with applications for granular, pulverized and semi-liquid materials. Complete installation data for thick or thin-walled bins, tanks, silos, and hoppers are given.

Applications for inside, outside, or suspended interior installations are furnished. Numerous wiring diagrams are included for installation and maintenance crews' reference. Also described is a unit for introducing low-pressure air into dry, finely ground materials which may tend to pack and bridge.

"The Eyes of the Bin" is issued by Bin-Dicator Co., Dept. CP, 13946 Kercheval Ave., Detroit 15, Mich. Specify CP 7718, pages 2 and 3.

**Arching, bridging, sticking in bins is overcome with portable air vibrating unit . . .**

steps up unloading of materials having a tendency to pack down in hoppers

**Uses:** For handling granular materials in bins, hoppers, chutes, flasks.

**Features:** Eliminates arching, bridging and sticking conditions. Quick, easily portable unit steps up unloading of materials having a tendency to pack down, starts and stops instantaneously, and is well suited on applications where one vibrator can serve several bins.

**Description:** Cast steel male bracket on the 2" piston diam portable air vibrator fits snugly into female bracket (see photo). Overall dimensions of the Cleveland 2" LSR: length, 10"; height, 5"; width, 5 1/2"; weight, 30 lb. Female bracket: overall width, 11"; height 7 1/2"; thickness, 2 1/2". Company's complete line currently consists of 29 different mountings and 14 piston diameter sizes.

(Development of the Cleveland Vibrator Co., Dept. CP, 2828 Clinton Ave., Cleveland, Ohio . . . or for more information check CP 7719 on handy form, pages 2 and 3.)

**Hydraulic loading ramps subject of illustrated brochure**

Brochure details complete line of hydraulic adjustable loading ramps. Units come in two basic types. One type is designed to become a part of, or an extension of, existing loading docks. Other units are built into the pavement in front of the loading dock. Engineering diagrams and application information are included.

Adjust-A-Dock brochure is issued by Rowe Methods Inc., Dept. CP, 2534 Detroit Ave., Cleveland 13, Ohio. When inquiring specify CP 7720 on handy form, pages 2 and 3.

# Low in cost! Highly effective!



Midwest food processor handles corn products with two FLEXMOUNT Oscillating Conveyors. In the insulated conveyors material is steamed enroute. Particularly important: the ease of cleaning which prevents bacteria growth.

## FLEXMOUNT Conveyors can be installed from stock

**Standardize on this versatile oscillating conveyor for your hard-to-handle materials**

**M**ASS-PRODUCED in standard lengths and standard widths, FLEXMOUNT Oscillating Conveyors cost far less than specially engineered units. They can be built up to any required length . . . from sections carried in stock.

FLEXMOUNTS are as easy to install as they are to order. Requiring an opening only slightly larger than the trough, they're a natural for restricted space. And

the all-metal, leakproof trough has proved the low-cost and sanitary method for moving scores of hard-to-handle materials.

Get complete information on FLEXMOUNT Oscillating Conveyors from your nearby Link-Belt office or distributor. He can give you a "desk-top" demonstration of FLEXMOUNT efficiency. And be sure to ask for Book 2478.

**How Positive Action moves material**



Positive-action, constant-stroke eccentric provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum.

# LINK-BELT

**FLEXMOUNT OSCILLATING CONVEYORS**

**LINK-BELT COMPANY:** Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

When inquiring check CP 7721 on handy form, pgs. 2-3





## Handle Drums with Ease ...ON **ALVEY** CONVEYORS

You can simplify your drum traffic, eliminate dangerous and costly man-handling by putting drums on Alvey Conveyors.

Whether its drums, bags, boxes, cartons, sacks — or any other packaged goods you are moving, it may pay you to call in an Alvey engineer. He will show you how Alvey is helping other companies like yours. No obligation, of course.

**ALVEY CONVEYOR MFG. CO.**  
9308 Olive St. Rd., St. Louis 24, Mo.

BRANCH OFFICES IN PRINCIPAL CITIES

# ALVEY

When inquiring check CP 7722 on handy form, pgs. 2-3

### MATERIAL HANDLING

**Hardy hoister handy for moving and lifting jobs**

**Uses:** For moving machinery, replacing circuit breakers, loading drums, and other lifting tasks.

**Features:** Planetary gear winch lifts 500 lb load 3" with each crank revolution.

**Description:** Arc-welded, 500 lb capacity model has standard platform size of 24 x 24". Height is 71" and length 35 1/4". It weighs 205 lb.



Lifts 3" with each crank revolution

For specialized handling, lifting platform can be replaced by lifting arm for use with coils, cradle typed platform to hold rolls, roller platform, or forks.

(Product of Lewis-Shepard, Dept. CP, Watertown, Mass. . . . or for more information check CP 7723 on handy form, pages 2 and 3.)

### Bulletin outlines features of spur gear hoist

Four-page, two-color bulletin describes manufacturer's light-weight spur gear hoist. Cut-away drawing in bulletin shows simplicity of hoist design and ease of servicing.

Bul CH is issued by The Coffing Hoist Company, Dept. CP, 800 Walter St., Danville, Ill. When inquiring specify CP 7724 on handy form, pages 2 and 3.

## "Weld-Bilt" EQUIPMENT GIVES YOU LONGER SERVICE IN LABOR- SAVING MATERIALS HANDLING

You can SEE the greater strength and durability in WELD-BILT Equipment . . . in heavier arc-welded construction, in sturdier operating parts, in many innovations that assure easier, friction-free operation. Every piece of "Weld-Bilt" equipment is designed to save operator fatigue, protect product and save money both on original cost and maintenance expense.

You can easily PROVE "Weld-Bilt's" superiority through many more years of actual performance in hundreds of plants all over the Nation. It means your lowest possible investment-per-year in time and labor saving.

**"Weld-Bilt"**  
PRODUCTS

Portable Electric Elevators

Pallet-Type Hydraulic Lift Trucks

Hydraulic Lift Trucks

Two-Wheel Hand Trucks

Skid Platforms

Platform Trucks

WEST BEND EQUIPMENT CORP.  
MATERIALS HANDLING ENGINEERS  
322 Water Street, West Bend, Wisconsin

When inquiring check CP 7725 on handy form, pgs. 2-3

## AIR CYLINDER POWER UNIT

offers a choice

of  
**SIX BUILT-IN  
VALVES**



Now, the Bellows Air Motor — the only air cylinder with an integral valve — offers a choice of six built-in valves:

1. Finger-touch manual control valve.
2. Low voltage electrical control — standard or explosion-proof.
3. 110 volt maintained contact electrical control.
4. Maintained pressure air pilot valve control.
5. Momentary exhaust air poppet valve control.
6. Continuous cycling control.

Here is a range of air cylinders with integral valving that offers the engineer every latitude in pneumatic design.

Completely described in Bulletin CL-50  
FREE on Request. Write for it today,  
Dept. CP 454.

**The Bellows Co.**  
AKRON 9, OHIO

When inquiring check CP 7726 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING

### Tells wide range of applications for continuous weighing device

Materials accounting, continuous feeding, batch control and continuous proportioning control are among applications listed by manufacturer in publication for scale feeders and meters.

Flow diagrams, descriptions, and features of both Merchen Scale Feeders and meters are given. Illustrations include technical installations in various industries.

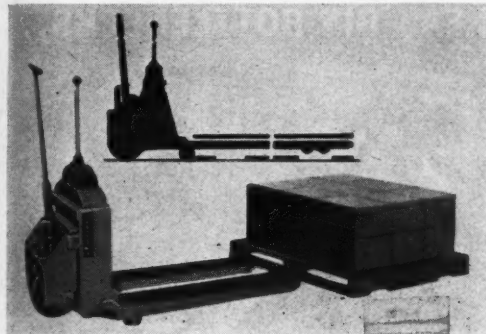
Publication TA-1002-M, "The Best Weigh is the Merchen Way", may be secured upon letterhead request to the Feeder Dept., Wallace & Tiernan, Dept. CP, Box 178, Newark, N. J.

### Retracting rear wheels overcome interference of lowered deck in handling pallets

**Uses:** For handling loads on double-faced pallets.

**Features:** Automatically retractable rear load wheels allow pallet truck forks to enter a double-faced pallet without interference with lowered deck. Less than 30 lb effort required to pull 2000 lb load on hard level concrete floor.

**Description:** Auxiliary wheels on manufacturer's Model D Pallet Load Lift keep rear load wheels



Rear load wheels are automatically retractable

approximately 1" off floor so that pallet truck forks can clear bottom boards of double-faced pallets, thus reducing damage and improving maneuverability.

Overall width of truck is 22"; width of forks 7 1/4"; opening 7 1/2". Forks are designed to enter vertical space of 3 3/8". Overall length of truck, not including forks, varies from 13" to 24".

Trucks are made entirely of steel. Rear wheels are tandem. Each rear low wheel is furnished with sealed ball bearings, two bearings per wheel. Wheels are available in aluminum, cushion rubber, and plastic. Front wheels are 8" diam x 2" face, are equipped with roller bearings.

(Development of Market Forge Co., Dept. CP, 27 Garvey St., Everett, Mass. . . . or for more information check CP 7727 on handy form, pages 2 and 3.)



## One-ton dust pan

**"PAYLOADER"** tractor-shovels pay dividends empty eleven ways handling bulk, loose materials in all kinds of industries. One of the most interesting is at this foundry and machine shop. The "PAYLOADER" positions its bucket under the hopper of the dust collector, the gate is opened and a ton or more of dust flows quickly into the bucket through a canvas boot—a clean, dust-free operation.

Scooping, shoveling, digging, carrying, spreading and all sorts of lifting, loading, unloading and hauling jobs both indoors and outdoors are "PAYLOADER" duties in thousands of plants. Multiple speeds in both directions, short-turning ability and easy-handling enable them to work fast in close, awkward places.

It will pay you to find out how modern "PAYLOADERS" can improve your output and simplify your material-handling problems. The Frank G. Hough Co., 744 Sunnyside Ave., Libertyville, Illinois.



Bentonite and other bagged materials are quickly carried from boxcar and stacked. Hydraulic power gives precise bucket control.

**JOB STUDIES** are available, illustrating and describing operations in several different plants. These helpful, authorized studies can be secured on request, without obligation.



YOU CAN'T COMPETE IF YOUR EQUIPMENT IS OBSOLETE

# **PAYLOADER®**

SAY "HUFF"

When inquiring check CP 7728 on handy form, pgs. 2-3





BIG or LITTLE

BARREL or BAG

## RAPISTAN CONVEYORS

cost less, earn more, because . . .

You save with "Standardized" Units. You may need a complete inter-floor system for warehousing-shipping operations, or simply smoother flow of processing - packaging - inspection. Whatever your conveyor requirements, a Rapistan system of standardized units will do the job better, for less. All Rapistan conveyors, both power and gravity, can be used together in an almost endless range of economical combinations. You get a system exactly right for your needs, without resorting to higher priced "specials".

Installation costs are lower, too. Thanks to the many different models of Rapistan conveyors, your system is pre-engineered to your particular layout. It can be installed quickly and economically without expensive

alterations. As your conveyor needs expand or change, your Rapistan equipment can be realigned to meet them. Your proximity to one of the fifty Rapistan Sales-Service agencies assures factory-trained installation and even a contractual service agreement, if desired.

You get more than good equipment. You get a conveyor system that is superbly "right" for you . . . a system carefully planned and installed to give your business the strong competitive edge of a truly effective materials handling program. We believe you'll find, as so many have found, that an engineered system by Rapistan costs less to buy and install, earns more and bigger dividends, than any other system, anywhere!

### ASK FOR THESE FIELD REPORTS



Get these data-packed, illustrated reports on solutions to actual handling problems in Chemical Processing field. Each describes a specific problem as it existed, equipment installed, results obtained. No obligation, mail coupon today.

The RAPIDS-STANDARD COMPANY, Inc.  
216 Rapistan Building Grand Rapids 2, Mich.  
Representatives in Principal Cities

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

**Rapistan** BETTER CONVEYING EQUIPMENT

CONVEYOR: Gravity and power belt • INDUSTRIAL CARTER • WHEEL-DRY TRUCKS

When inquiring check CP 7729 on handy form, pgs. 2-3

### MATERIAL HANDLING

#### Dual purpose truck handles pallets and skids

**Uses:** As hand lift trucks which can be used with either pallets or skids.

**Features:** Truck has arc-welded one piece frame with capacities to 6000 lb. Hydraulic lifting mechanism is sealed to prevent tampering, has no hose lines or couplings, and no breathers to collect dust.

**Description:** Hand truck has superframe which, when in "down" position, operates like any hydraulic platform type.



Truck in skid and pallet positions

When the frame is swung up it is automatically secured into place and is well out of the way for pallet handling.

(Truck is product of Lewis-Shepard, Dept. CP, 193 Walnut St., Watertown, Mass. When inquiring specify CP 7730 on handy form which is located between pages two and three.)

#### Illustrates, gives data on elevator buckets

Twelve-page catalog illustrates pertinent data with prices on manufacturer's line of steel elevator buckets.

Cat #100 is issued by The Standard Metal Manufacturing Co., Dept. CP, Malinta, Ohio. When inquiring specify CP 7731 on handy form, pages two and three.

## the ANSWER to lifting and dumping bottlenecks

ELIMINATE MANUAL LIFTING and speed up materials handling with a CESCO skip-hoist Dumper. Reduce handling time and costs. Single and multi-purpose portable models in standard heights from 6 to 10 ft. Stationary models to 20 ft. Up to 1500 lb. per load, 100 loads per hour. Easy, safe push-button control eliminates accidents.

LIFTS AND DUMPS DRUMS, BOXES, BULK, BAGS, MECHANICALLY

ESSEX CONVEYORS, INC.  
165 Franklin Ave. • Nutley 10, N. J.

COLSON EQUIPMENT & SUPPLY CO.  
1317 Willow Street • Los Angeles 13, Calif.



Write for Complete Catalog

**CESCO SKIP-HOIST DUMPER**

When inquiring check CP 7732 on handy form, pgs. 2-3

## BREAK BIN BOTTLENECKS..



with SPO air vibrators

SERIES 81

For steady flow of powdered and granular materials from bins, hoppers and chutes, specify SPO air vibrators. Key to their superior performance is a special corrosionproof cylinder liner. It assures (1) full-power starting, (2) thorough lubrication, (3) high-speed operation, (4) low air consumption, and (5) long life. Types and sizes to meet every need.



1836-51

Write for Bulletin 50 for complete details.

**SPO INCORPORATED**

6531 Grand Division Avenue • Cleveland 25, Ohio

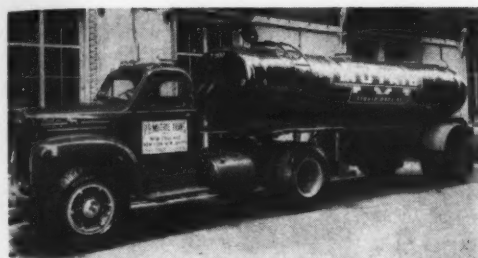
When inquiring check CP 7733 on handy form, pgs. 2-3

## MATERIAL HANDLING

### Nearly 2-ton reduction in trailer tank adds extra load weight capacity with 3400 gal plastic unit

A 3400 gallon plastic transport tank, the first such unit of its kind and having three times the capacity of any previous plastic tank, has recently been put into operation.

Weighing only 7025 lb, nearly two tons (3600 lb) less than the steel tank it replaces, the tank is



Plastic tank with 3400 gal capacity weighs only 7025 lb

one of the largest one-piece molded structures ever made. It measures 21' 9" long; 6' 2" wide; and 4' 4" high, unmounted.

The new tank mounted on a Fruehauf Trailer special chassis is made of American Cyanamid's Laminac polyester resin with Owens-Corning fibrous glass reinforcement. Bending stress during tests was 840 lb/sq in, while breaking point was reported as 20,000 lb/sq in.

No special lining is required, a feature estimated to save \$1000 per unit in construction.

Should leaks develop, such plastic tanks can be patched with resin and glass.

Tank was molded by Carl M. Beetle Plastics Corp., mounted on a special single-axle Fruehauf trailer pulled by a Mack tractor. Special dent-resistant fenders, and hose and pump compartments are made of the same glass combination as the tank.

(Information courtesy of Fruehauf Trailer Co., Dept. CP, 10940 Harper Ave., Detroit, Michigan.)

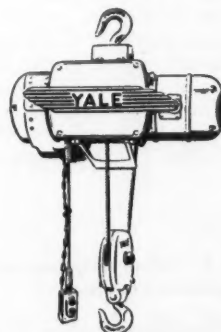
### Features of gravity wheel conveyors are outlined in 4 pages

Illustrated, 4-page catalog reviews a few of the more common uses of manufacturer's gravity wheel conveyors, ease of setting up, moving, or storing 10' gravity wheel sections, and their construction. Specifications for caster equipped supports, adjustable stands, standard straight sections, and reversible curved section are included.

Gravity Wheel Conveyor Cat 750 B is issued by Samuel Olson Mfg. Co., Inc., Dept. CP, 2418-22 Bloomingdale Ave., Chicago 47, Ill. When inquiring specify CP 7734 on handy form, pages 2 and 3.

IF YOU MAKE, MOVE,  
OR MARKET  
CHEMICALS

You can't  
afford to  
leave this  
out of  
your  
plans!



**YALE\***  
INDUSTRIAL  
TRUCKS AND HOISTS

\*Reg. U. S. Pat. Off.

Progressive planning calls for modern handling methods in old and new plants alike. For, materials handling can account for as much as one-third of operating costs . . . remains the one phase of most manufacturing operations in which sizeable savings are still possible.

In fact, you can cut handling costs in half . . . and then in half again through proper use of YALE equipment. You can also increase produc-

tive capacity . . . make savings in time, space, manpower, and plant maintenance.

YALE offers the widest choice of truck models, fuels, capacities, and attachments. Under the Finance-Lease Plan, you can put YALE equipment to work for you . . . without delay . . . and without a major investment.

Get complete information from the YALE Sales and Service facilities located near you. Or mail the coupon.

MAIL THIS COUPON TODAY

The YALE & TOWNE Mfg. Co., Dept. 124  
Roosevelt Boulevard, Phila. 15, Pa.

I would like to have additional facts about

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☐ Yale 3-way Finance Plan.

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In Canada write: The Yale & Towne Manufacturing Co.  
St. Catharines, Ontario, Canada

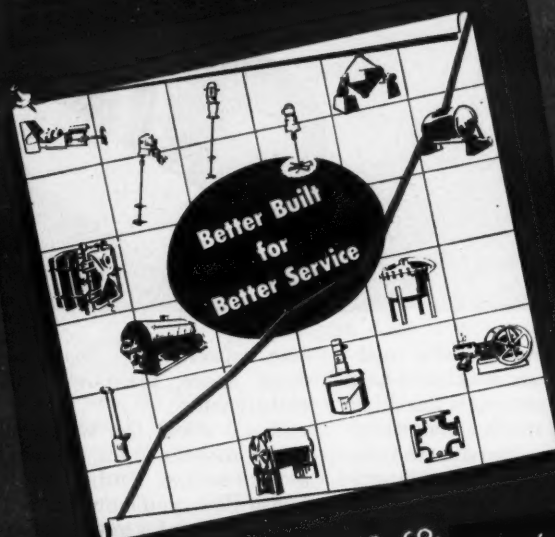
Gas, Electric, Diesel and LP-Gas Industrial Trucks • Worksavers • Hand Trucks • Hand and Electric Hoists • Pul-Lifts

When inquiring check CP 7735 on handy form, pgs. 2-3



*"Take it from  
one who knows"*

all users  
of process  
equipment  
should have  
this catalog



J. P. DEVINE MFG. CO.

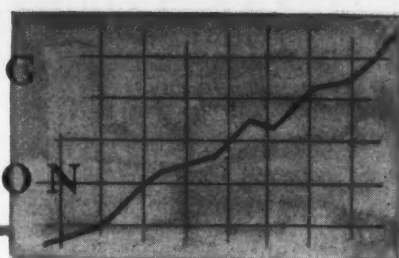
Write for Your  
Copy Now

Here's a catalog with complete descriptions and data to help you select AGITATORS, MIXERS, BLENDERS, BALL AND PEBBLE MILLS, IMPREGNATORS, DRYERS, VACUUM PUMPS, PRESSURE VESSELS, CONDENSERS and JACKETED FITTINGS. Also listed are Devine Kettles, Fumigators, Heat Exchangers, Tanks, Autoclaves, Bubble Towers, Vulcanizers, Digesters, Evaporators, Stills and Special Process Equipment.

J. P. DEVINE MFG. CO.

When inquiring check CP 7736 on handy form, pgs. 2-3

## EXPANDING CHEMICAL PRODUCTION



### Complete \$1.5 million expansion program for fertilizer

Mathieson Chemical Corp has completed an expansion program costing approximately \$1.5 million at its Pasadena, Texas plants, it has been announced.

Commercial production began early this year from a new \$1.1 million unit for manufacture of chemical fertilizer. Operation of the unit is expected to increase the company's production there by 25 per cent.

Modification of the existing sulfuric acid plant and fertilizer plant at Pasadena, costing slightly more than \$400,000, have also been completed in recent weeks.

This expansion provides the Houston area with the largest chemical fertilizer plant in the southwest.

### New fertilizer plant in operation on Indiana site

Production has begun from the \$1 million fertilizer manufacturing facilities of the Davison Chemical Corp at New Albany, Indiana.

### Completes alumina plant expansion program

Increased plant facilities will make available enough alumina to produce over 100,000 tons of aluminum metal per year. New equipment added at the Mobile Alumina Works of Aluminum Company of America involved all facilities for refining bauxite under the Bayer process. New ore storage and office buildings were also added.

### Plan \$3 million polychemical lab for plastics expansion

Preliminary work on a \$3 million laboratory for the Polychemicals Department of DuPont is underway at Wilmington, Del. The new laboratory, which will replace

company's lab facilities at Arlington, N. J., will have equipment for developing technical data on the use and processing of Polychemicals Department. Engineering services will also be provided. Construction is expected to be completed early next year.

### Expand H<sub>2</sub>SO<sub>4</sub> production capacity of plant to nearly double

Further enlarging of General Chemical Div., Allied Chemical & Dye Corp., sulfuric acid production capacity at its Detroit Works in River Rouge, Mich. has been announced.

Scheduled for production late next summer, the new facilities will nearly double the present capacity of the plant. Construction costs are not yet available.

### Adds \$500,000 of equipment to naval stores plants

Additional chemical production equipment at The Glidden Company's Naval Stores Division plants at Jacksonville, Fla., and Valdosta, Ga., will amount to one-half million dollars when completed. Florida plant produces terpene chemicals; rosin-based and other synthetic resins are made in the Georgia facilities.

### Synthetic rubber to be produced at Montague, Michigan

Preliminary plans to make Neoprene rubber at a Montague, Mich., site have been announced by E. I. du Pont de Nemours and Company (Inc.). One thousand acres have been optioned near the Hooker Electrochemical Company chlorine plant and the location on which Union Carbide and Carbon Corporation will put an acetylene plant. At present, du Pont is conducting engineering and economic studies. Tentatively, the company expects to have unit in partial operation by early 1956.

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**Expect to triple plastics production  
at new Louisiana plant**

Construction is now underway at Baton Rouge, La. for additional plastics production facilities by Naugatuck Chemical Div., U.S. Rubber Co.

The new facilities, an addition to Naugatuck Chemical's plant are expected to triple the company's output of its brand of resin-rubber plastic. They are expected to be in operation by July of this year.

**Department of the Army negotiating  
ammonia plant lease**

Negotiations are underway to lease ammonia producing section of Government owned Missouri Ordnance Works at Louisiana, Mo. to American Cyanamid Company. Plant was built in 1941.

**Dustless, noiseless operation  
in new diatomite quarry**

Dicalite Division of Great Lakes Carbon Corporation has acquired control of 165-acre source of diatomite in Los Angeles County. Located three miles from their Walteria processing plant, deposit will be worked by a dustless and noiseless trenching operation, that will be completely hidden from local residents by trees and shrubbery.

**Aromatic Chemicals plant  
starts operations**

Operations have started at Rhodia, Inc. aromatic chemical plant in Paterson, N. J. Processes were recently reacquired from E. I. du Pont de Nemours & Co. Aromatics, perfume bases, and specialties will be made at the plant.

**Engineering contract awarded  
for acid and nitrate plant**

An engineering contract for planning a nitric acid and ammonium nitrate plant has been awarded to C. F. Braun & Company by Brea Chemicals, Inc., subsidiary of Union Oil Company of California. Cost is estimated at \$2,500,000.

Proposed facilities would be located adjacent to ammonia plant at Brea, California, which company now leases and which is scheduled for completion this month.

# *Built for* SEVERE DUTY

frequent starting • inching •  
reversing • dynamic braking

**ALLIS-CHALMERS**  
**Type 256**  
**AIR CONTACTOR**  
FOR 2300 TO 5000-VOLT  
MOTOR CONTROL

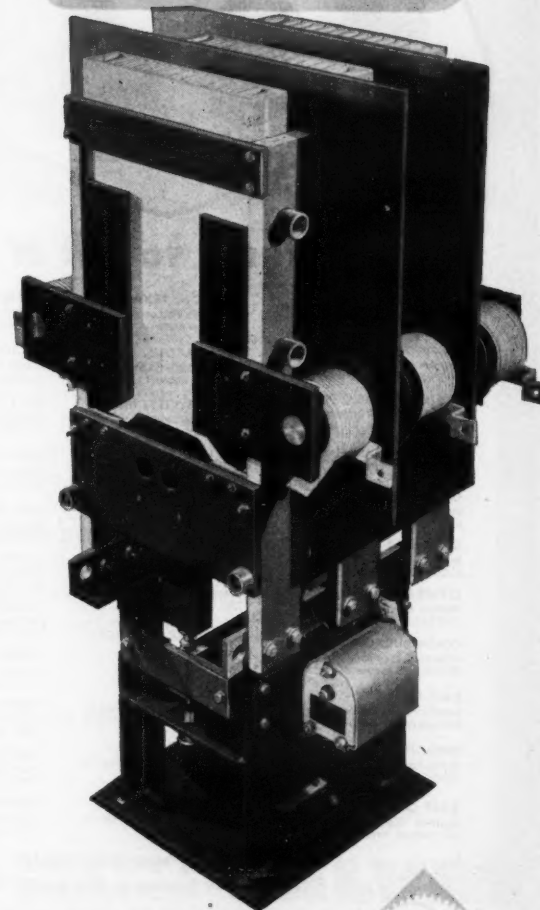
*Durability and long-term dependability were given prime consideration in the design of the Allis-Chalmers Type 256 air-break contactor. As a result, the roughest repetitive duty becomes routine — contact operations are actually numbered in the millions with a minimum of servicing.*

#### DESIGN FEATURES

By utilizing a simple vertical motion and double break contacts, troublesome maintenance factors, such as mechanical linkages, turning shafts, shaft bearings and flexible leads, have been eliminated. From the operation standpoint, two gaps in series cut arc voltage in half. Rapid arc extinction is further facilitated by magnetic blowouts at each gap, operating with arc chutes designed to take full advantage of dual blowouts.

**In Allis-Chalmers Type H high voltage starters, Type 256 air-break contactors — along with meters, overload relays, current limiting fuses, auxiliary switches — are coordinated to meet heavy duty demands — to provide high capacity interruption and complete protection for man, motor and machine. For complete information see your nearby A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for bulletins 14B6410B and 14B7303.**

A-4325



## ALLIS-CHALMERS



When inquiring check CP 7737 on handy form, pgs. 2-3



# CESCO

**RIGHT...  
before your Eyes!**



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Guardian Safety Equipment Co.  
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Guardian Safety Equipment Co.  
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**BOSTON, MASS.**  
General Equipment Corporation  
261 Franklin Street

**BUFFALO, N. Y.**  
The Watson Company  
1443 Main Street

**CHICAGO, ILL.**  
Universal Safety Equipment Co.  
5115 Diversey

**CINCINNATI, OHIO**  
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Williams & Co., Inc.  
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Williams & Co., Inc.  
851 Williams Avenue

**DALLAS, TEXAS**  
Guardian Safety Equipment Co.  
900 Jefferson Tower Bldg.

**DETROIT, MICH.**  
Averill Equipment Company  
19225 Conant Avenue

**EAST ORANGE, N. J.**  
Guardian Safety Equipment Co.  
491 Prospect Street

**HOUSTON, TEXAS**  
Guardian Safety Equipment Co.  
1915 A Westheimer

**INDIANAPOLIS, IND.**  
Averill Equipment Company  
1917 North Goodfell

**KANSAS CITY, MO.**  
Safety, Incorporated  
17½ E. 31st Street

**KNOXVILLE, TENN.**  
Safety Equipment Distributing Co.  
632 W. Main Street

**LITTLE ROCK, ARK.**  
Fire Appliance & Safety Co.  
1174 W. Markham

**LOS ANGELES, CALIF.**  
Guardian Safety Equipment Co.  
7223 S. Main Street

**LOUISVILLE, KENTUCKY**  
Williams & Co., Inc.  
1109 S. Preston Street

**MILWAUKEE, WIS.**  
Universal Safety Equipment Co.  
3155 S. 7th Street

**PEORIA, ILL.**  
Universal Safety Equipment Co.  
116 S. Garfield

**PHILADELPHIA, PA.**  
Guardian Safety Equipment Co.  
214 S. 45th Street

**PITTSBURGH, PA.**  
Williams & Co., Inc.  
901 Pennsylvania Avenue

**ST. LOUIS, MO.**  
Safety, Inc.  
2608 Olive Street

**ST. PAUL, MINN.**  
Continental Safety Equipment, Inc.  
1551 Selby Ave.

**SALT LAKE CITY, UTAH**  
Universal Fire & Safety  
Equipment Co., Box 1587

**SAN FRANCISCO, CALIF.**  
Guardian Safety Equipment Co.  
50 Hawthorne Street

**SPOKANE, WASH.**  
Spokane Safety Appliances  
W. 314 Pacific Ave.

**TOLEDO, OHIO**  
Williams & Co., Inc.  
650 E. Woodruff Avenue

**TULSA, OKLA.**  
Guardian Safety Equipment Co.  
1742 S. Main Street

**WICHITA, KANS.**  
Guardian Safety Equipment Co.  
723 S. Broadway

**MEXICO CITY, D. F.**  
Safety Equipment S. A.  
Sullivan-95

**MONTREAL, CANADA**  
The Butler Optical Company, Ltd.  
1520 Mountain Street

**CHICAGO EYE SHIELD COMPANY**  
2316 Warren Boulevard, Chicago 12, Illinois

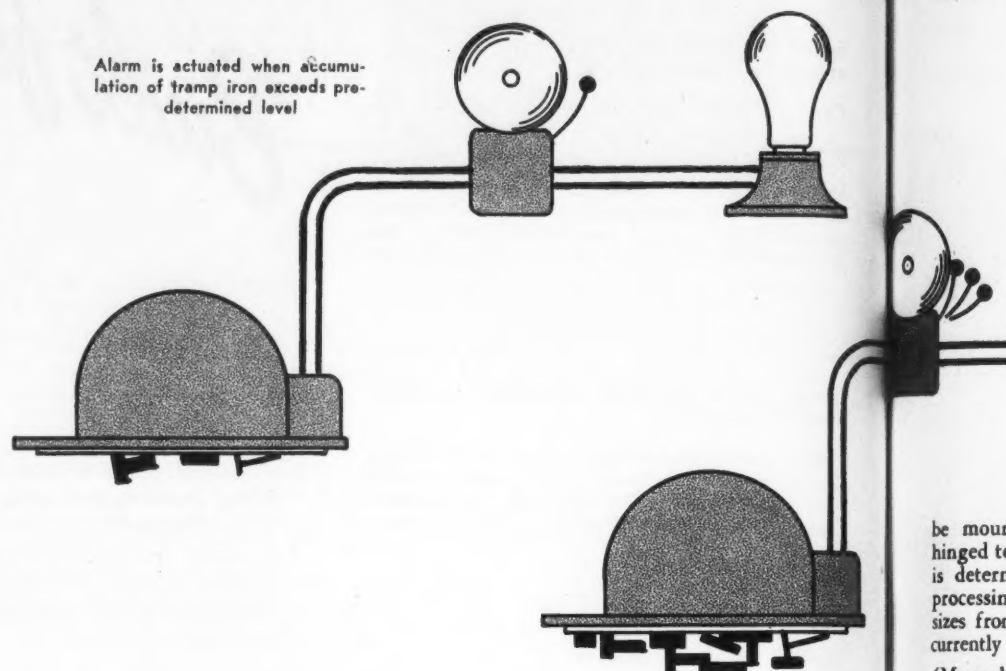


**CESCO FOR SAFETY**

When inquiring check CP 7738 on handy form, pgs. 2-3

*safety*

Alarm is actuated when accumulation of tramp iron exceeds predetermined level



## *built-in brain prevents overloading magnetic separator*

**Product contamination, machinery damage, fire and explosion hazards are minimized by removing tramp iron with permanent magnets. Control keeps system at peak efficiency**

Completely automatic alarm system has been developed for magnetic separators. Unit operates by means of a sensitive "ferrometer" which constantly measures the quantity of tramp iron as it accumulates on permanent magnet's surface. Alarm is sounded — in form of lights, bells,

buzzers, etc — as soon as predetermined accumulation is reached.

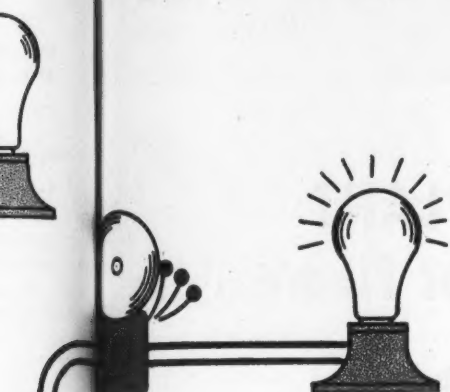
Signaling operation is based on a relatively uniform distribution of tramp iron across face of the magnet. Amount of iron accumulation required to actuate alarm can be readily adjusted. Once alarm signals its warning, it cannot be shut off until magnetic element has been cleaned.

Units are furnished with either a normally open or a closed switch, depending on action required. Open circuits are used to ring a bell or buzzer or light a light. Closed circuits are used to shut down lines of machinery.

Units are constructed of either aluminum and steel or all stainless steel. They can

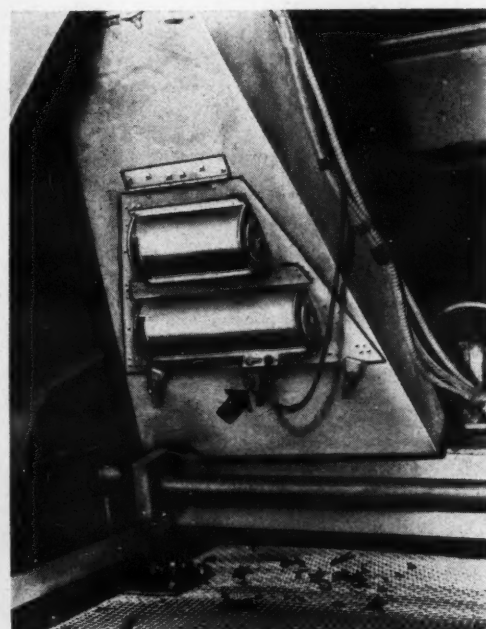
be mounted  
hinged to  
is determined  
processing  
sizes from  
currently  
(Magnala  
Co., Dept.  
or for m  
product, r  
form, pag

Installation  
claiming  
screens,  
cleaning



be mounted as a stationary installation or be hinged to swing down for cleaning. Width of unit is determined by inside width of the chute or processing line on which it is used. Standard sizes from 4 to 72 inches in 2 inch increments are currently available.

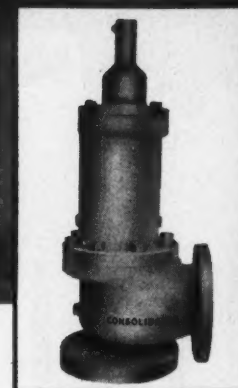
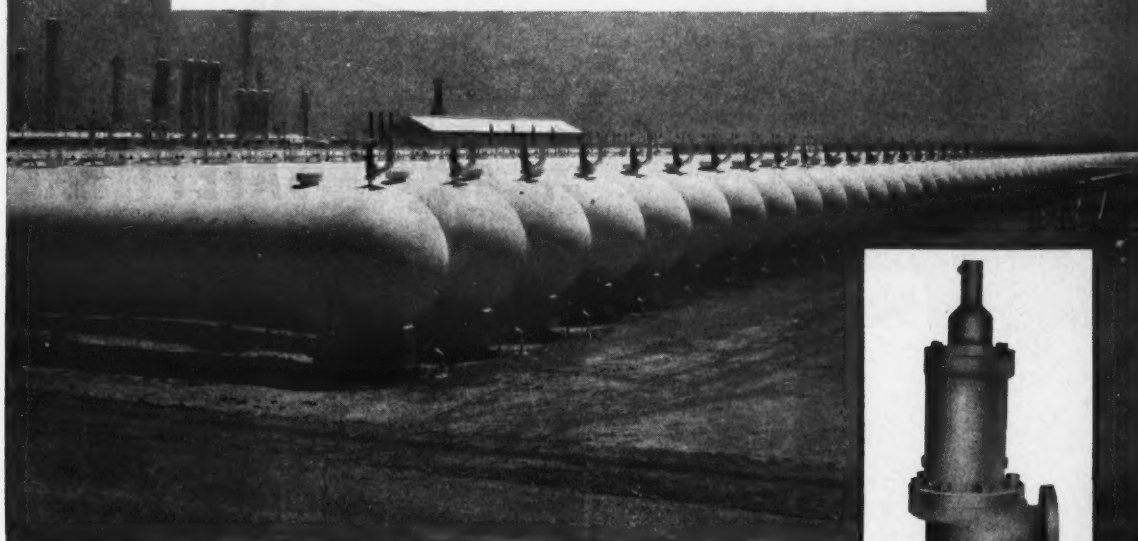
(Magnalarm is a product of Eriez Manufacturing Co., Dept. CP, 1945 Grove Drive, Erie 6, Pa. . . . or for more information concerning manufacturer's product, reader may simply check CP 7739 on handy form, pages 2 and 3.)



Installation of double-row Magnalarm on rubber reclaiming line keeps tramp iron from reaching sizing screens. Unit swings down on hinges for easy cleaning. Arrow points to alarm sensing element

## FOR ABSOLUTE PROTECTION

You Can Go Right Down the Line with . . .



## CONSOLIDATED SAFETY RELIEF VALVES

**COMPLETE PROTECTION** for personnel, property and equipment rates top priority in safety engineering wherever industry must confine gases, vapors and liquids in unfired pressure vessels. That is why Consolidated Safety Relief Valves are such a common sight on processing facilities, pipelines, pumps and storage tanks.

Consolidated Safety Relief Valves incorporate design and construction features that assure *dependable tightness* under

the severest discharge piping stresses. Unfired pressure vessels are absolutely safeguarded against overpressures. No matter how tough the conditions of use, you can be sure of continuously reliable performance at the rated capacity.

**SIMPLE DESIGN** — 25% fewer parts than ordinary safety valves — means that Consolidated Safety Relief Valves minimize maintenance and standardization problems and save in long-life operation.

Write for complete information:



## CONSOLIDATED SAFETY RELIEF VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** TULSA, OKLAHOMA  
MAKERS OF 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'HANCOCK' VALVES, 'ASHCROFT' GAUGES, AIRCRAFT PRODUCTS. BUILDERS OF "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

When inquiring check CP 7740 on handy form, pgs. 2-3



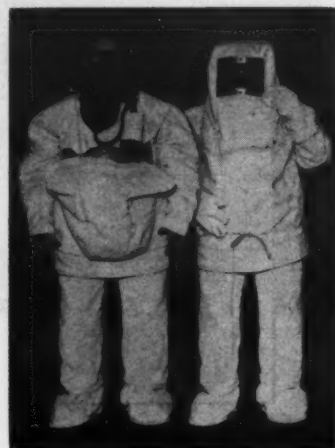
## SAFETY

### Dress for fire in 1 minute

**Uses:** Lightweight protective clothing is designed for emergency use in fire and fire-hazard rescues.

**Features:** Suit weighs only 28 pounds and can be donned without assistance in less than 1 minute.

**Description:** Lightweight fire rescue suit has an outer layer of 90% asbestos cloth. One inch of fiberglass insulation is covered with aluminum foil. An inner liner of



Rescuer has room for breathing apparatus

vinyl-treated glass cloth acts as a steam barrier.

Trousers are one piece and completely cover feet, legs, and lower abdomen up to a point eight inches below the armpits. Legs are wool-lined and "shoe" sections are double thickness. Hooded blouse extends well below waistline and contains a large laminated safety glass window permitting a wide field of vision. There is ample room for self-generating breathing apparatus.

Rescue blanket measuring 4 x 6' is available with suit. It is also made of 90% asbestos. Trousers, hooded blouse, gloves, and rescue blanket are conveniently stored in a case 12 x 15 x 19". Self-generating breathing apparatus can also be furnished for this suit. It provides sufficient oxygen for 15 minutes.

(Fire rescue suit is a development of Industrial Safety Specialties Co., Inc., 8th & Chestnut Sts., Perkasie, Pa. . . . or for more information check CP 7741 on handy form, pages 2 and 3.)

# PROTECTOSEAL

**PROTECTS** against explosion and fire...**SEALS** against evaporation

**APPROVED**

## LABORATORY AND PLANT SAFETY PRODUCTS for Flammables



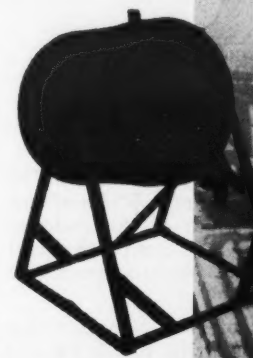
A

LABORATORY SHELF CAN



B

LABORATORY CAN WITH BOTTOM FAUCET



C

LABORATORY CAN WITH TILT FRAME



D

SAFETY CAN



E

LABORATORY DISPOSAL CAN



F

OILY WASTE CAN

**A LABORATORY SHELF CAN.** New space-saving oval shape for greater ease in handling; permits placing four cans in the same space formerly required for three. Easily grasped and used with one hand. Double-wall fire baffle in spout. Self-closing cap seals against evaporation; provides pressure relief.

**B LABORATORY CAN WITH BOTTOM FAUCET.** Equipped with perforated-metal fire baffles at faucet and filler openings. Openings have self-closing, spring-action closures. Shock rim at bottom elevates faucet for convenient use.

**C LABORATORY CAN WITH TILT FRAME.** An extra safe and convenient dispenser for accurate, drip-less pouring. Easily tilted; returns to upright position upon release. Faucet and filler openings have perforated-metal fire baffles and self-closing, spring action closures.

**D SAFETY CAN.** Double concentric fire baffle inside base of spout. Spring loaded cap makes tight closure; provides pressure relief. Squeeze grip handle for controlled pouring.

**E LABORATORY DISPOSAL CAN.** Wide 3/4" inside diameter spout permits easy use without a funnel; perforated-metal flame arrester at base of spout. Self-closing cap provides uniform sealing with pressure relief.

**F OILY WASTE CAN.** Tight, seam-welded body with snug fitting cover which closes automatically to smother fire. Cover opens wide with slight foot pressure on full width treadle.

**G TRANSFER PUMP.** Provides complete protection in transferring flammable liquids. Three flame arresters: at spout, above bung adapter and at strainer inlet within the drum. Light-weight, aluminum alloy; brass telescopic tube.



TRANSFER PUMP

# PROTECTOSEAL

**PROTECTS** against explosion and fire... **SEALS** against evaporation

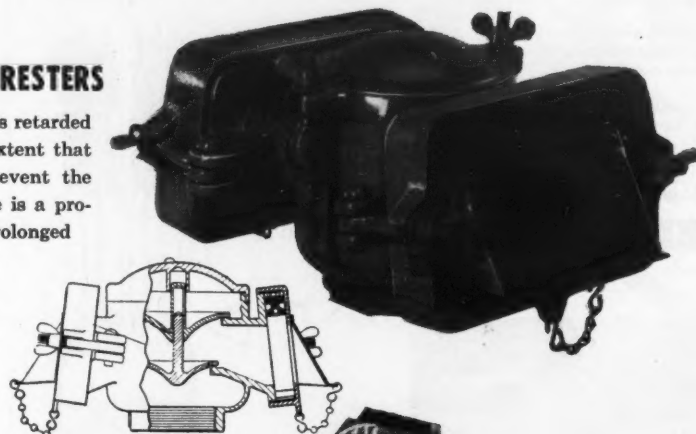
**APPROVED**

## FLAMMABLE BULK STORAGE SAFETY DEVICES

PROTECTOSEAL designs and builds a wide variety of equipment for the safe and economical handling of hazardous liquids in storage. These include conservation vents, flame arrester vents, fill and vent units for inside and outside storage, as well as safety tank car loaders and unloaders, and other similar large volume safety storage products. Illustrated is a representative selection of commonly used items; for complete information use the coupon to request catalog.

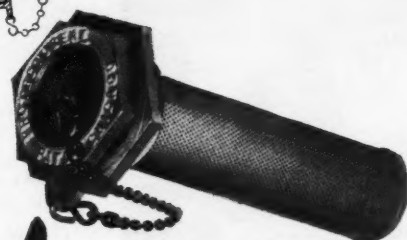
### CONSERVATION VENTS AND FLAME ARRESTERS

provide pressure and vacuum relief, and breathing is retarded sufficiently to reduce evaporation but not to the extent that tank structure is endangered. Flame arresters prevent the passage of flame to tank interiors even when there is a prolonged burning of vapors at the vent opening. Prolonged burning and flashback tests on these vents have been passed successfully to secure the approval and listing as standard by both Underwriters' Laboratories and Associated Factory Mutuals Laboratories. All aluminum construction.



### DRUM BUNG FITTING

A combination flame vent inserted in the bung opening which provides vacuum and automatic pressure relief, and guards against explosion under fire conditions. Double perforated metal fire baffle extends into drum and permits refilling without danger of interior fire.



### SELF-CLOSING AUTOMATIC FAUCET

Has perforated brass flame arrester within the body at the outlet where it provides the best protection and is easily removed for cleaning. Valve is outside body where valve seat is not distorted by excessive pressure. Supplied standard with Buna N, Neoprene or Thiokol gaskets; other gasket materials available upon request.



Mail Coupon for Catalogs, Price Lists and complete information.

### THE PROTECTOSEAL COMPANY

1932 South Western Avenue, Chicago 8.  
In Canada: Safety Supply Co., Toronto.



The Protectoseal Company  
1932 S. Western Avenue, Chicago 8, Ill.

Please send the information checked below:

- ☐ Bulk Storage Safety Equipment Catalog and Price List
- ☐ Laboratory Safety Equipment Catalog Sheet
- ☐ Safety Can Catalog and Price List
- ☐ Protectoseal Safety Bulletin: "How to Handle Flammable Liquids in the Plant."

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



## SAFETY

**Safety reminder signs quickly put up, changed...**

self-sticking, they require no frames, no tacks

**Uses:** Two hundred stock safety signs are available.

**Features:** These signs can be applied to any smooth surface — plaster, cement, wood, metal — and they are self-sticking.

**Description:** Signs are put on by applying light pressure. Self-sticking, they are made of heavy, durable fabric with an adhesive



Safety sign can be quickly applied when needed

backing. Material resists moisture, dirt, grime, and grease. These signs can be used indoors or out.

Printed in three colors, they are available in both a 2 1/4 x 9" size and a 2 1/4 x 4 1/2" size. Color combinations include red letters on white background, yellow letters on black background, and black letters on white background. Signs can also be printed to individual specifications.

(Safety signs are prepared by Westline Products Div., Western Lithograph Co., Dept. CP, 600 East Second St., Los Angeles 54, Calif. ... or for more information check CP 7742 on the convenient Reader Service slip which is located between pages two and three.)

For more information on product at left, specify CP 7743 ... see information request blank between pages 2 - 3.



Hold an **eel** with

**Super-Safe Grip**

**PIONEER**

**Stanzails®**



*N-35 light weight  
all-neoprene 10 1/2" length.  
Snug curved fingers  
Super-Safe grip surface  
holds oily, slippery  
objects as if dry.*

Non-slip grip on Stanzails acts like sand on ice. Handles wet, oily objects as if dry. Speeds work—cuts accidents.

PIONEER Processed milled neoprene gives extraordinary service in contact with oils, acids, caustics and solvents. Milled neoprene has higher tensile, greater tear resistance than any other oil-proof rubber.

Only a liquid-tight glove gives positive physical protection from conditions causing dermatitis.

32 PIONEER Stanzail styles, weights, sizes and colors. Send for Stanzail catalog—shows quickly how to pick the best, most economical glove for each job.

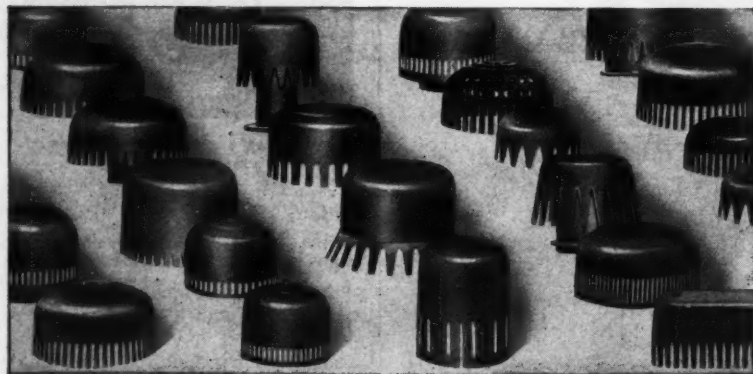
**The PIONEER Rubber Company**

241 Tiffin Road  
Willard, Ohio



QUALITY GLOVES FOR 35 YEARS

When inquiring check CP 7744 on handy form, pgs. 2-3



## SEND FOR PSC BUBBLE CAP BULLETIN 21

*Largest Compilation of Engineering Data.*

*Lists 200 Styles Furnished Without Die Cost.*

This standard reference contains complete specification information for over 200 standard styles of bubble caps and risers. Also drawings for use in determining methods of tray assembly. All styles list-

ed in Bulletin 21 are furnished promptly, without die cost, and in any alloy to meet your coking or corrosion problems. Special caps gladly designed; write as to your needs.

**THE PRESSED STEEL CO., 709 N. Penna. Ave., Wilkes-Barre, Pa.**



Custom Fabricators for the Process Industries Since 1928. Send Your Blue Prints

When inquiring check CP 7745 on handy form, pgs. 2-3

### SAFETY

**Dries gloves quickly  
without danger of  
burning . . .**

twin streams of warm air do the job

An accessory for company's Sani-Dry electric boot dryer is now available for drying gloves. Consisting of a set of two forms in the shape of hands, glove holders are easily attached to air stream tubes which are ordinarily used for drying boots.



Twin streams of warm air dry gloves quickly without danger of burning or damage because of excessive heat. Gloves can be put back into service faster.

(Glove dryer is a product of The Chicago Hardware Foundry Co., Dept. CP, 2600 Commonwealth Ave., North Chicago, Ill. . . . or check CP 7746 on the convenient Reader Service slip located between pages two and three.)

**Use of automatic doors  
in hazardous locations  
permitted by switch**

**Uses:** Explosion-proof switch is for use with manufacturer's "Magic Door" installations.

**Features:** Switch permits use of automatic door operators in industrial locations where possible explosive conditions prevented use previously.

**TRI-LOK**  
safety  
steps

"A  
**STRONG STEP  
TO SAFETY**"

Each Tri-Lok step consists of a panel of Rectangular, Diagonal, or U-type Tri-Lok flooring in any desired width, length, depth, and bar spacing.

**SAFE**—checker plate nosing bars make each step stand out clearly. Abrasive edging also available.

**CLEAN**—clogless, rivetless Tri-Lok joint prevents accumulation of dirt, moisture, rust.

**STRONG**—added strength provided at maximum load contact by shape and rigidity of nosing bar.

Write today for bulletin PL-1103

**DRAVO CORPORATION**

National Distributor for the Tri-Lok Company  
Dravo Building, Pittsburgh 22, Pennsylvania  
Sales Representatives in Principal Cities



When inquiring check CP 7747 on handy form, pgs. 2-3

# DISCOVER

**how AIR POWER can speed  
your production jobs**



Find out how Air Power delivered by Ingersoll-Rand Type 30 Compressors, can save time, money and man-hours in your operations. Here are facts and figures every man responsible for production should have. Also, the reasons why Type 30 Compressors give you a greater volume of compressed air per hp input.

CLIP AND MAIL, NOW

782-3

**INGERSOLL-RAND CO., 11 Broadway, New York 4, N. Y.**  
Please send me, at no obligation, Booklet 1502-D on the complete line of I-R Compressors.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_  
(Please Print)

When inquiring check CP 7748 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW Ejectopump

COMPRESSED AIR OPERATED

### for ABRASIVE and INFLAMMABLE LIQUIDS and SEMISOLIDS

Requires no lubrication

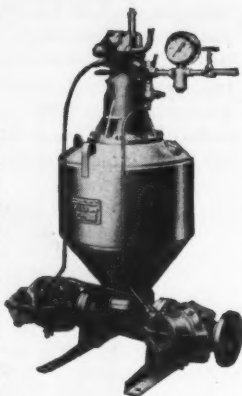
NO GLANDS

NO BEARINGS

NO MOVING PARTS

Now available for the first time in the U. S. Especially suitable for handling latex, bitumen, paint, chocolate, fruits and vegetables suspended in water, pottery slip, carborundum slurries, and various chemicals. Will not cause aeration or coagulation of materials. Available in 1½", 2", 3", 4" and 6" sizes.

Write today for complete details.



FERRO CORPORATION

Supplies Division

4184 EAST 56th STREET • CLEVELAND 5, OHIO

When inquiring check CP 7749 on handy form, pgs. 2-3

### Kleenslot THE PERFECT PREPARATION SCREEN GUARD

The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. All sizes and most materials furnished.

HERE'S HOW IT'S DONE

Cross section at left shows how KLEENSLOT Screens operate on a non-clogging principle.

Wedge Wire KLEENSLOT screen guards can be furnished in special sizes to your requirements in practically any type of long wearing metal. They are made to close tolerances like all Wedge Wire products—the width of each wire is held to plus or minus .002 to insure uniform opening width. All Wedge Wire features are embodied in these screen guards and it is to your advantage to consider them from the standpoint that they are non-clogging, non-blinding, strong, rigid, uniform and more economical in the long run.

WEDGE WIRE CORP.  
Gas St. at Nickel Plate R.R., Wellington, Ohio

Gentlemen:  
Please send us literature outlining the superiority of Wedge Wire construction.

COMPANY \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

Wedge-Wire CORPORATION

GAS ST. AT NICKEL PLATE R.R. • WELLINGTON, OHIO

SEND THIS COUPON TODAY!  
DON'T DELAY

When inquiring check CP 7750 on handy form, pgs. 2-3

## SAFETY

**Description:** Switch is enclosed in a cast iron housing meeting NEMA Type VII, Class 1, Groups C and D requirements for explosive gas atmospheres including locations where atmospheres of ethyl ether, gasoline, petroleum, naphtha, alcohol, acetone, lacquer solvent, and natural gas vapors may be present.

Light pressure opens doors, and they stay open while you pass through. Control can be located for hand use, at elbow height, or for tip-toe operation. Explosion-proof switch can be used with all types of Magic Door Operators.

(Explosion-proof switch for Magic Doors is a product of Magic Door Div., The Stanley Works, Dept. CP, 195 Lake St., New Britain, Conn. . . . or for more information check CP 7751 on handy form, pages 2 and 3.)

### Safe, effective cleaning of electrical equipment done by solvent . . .

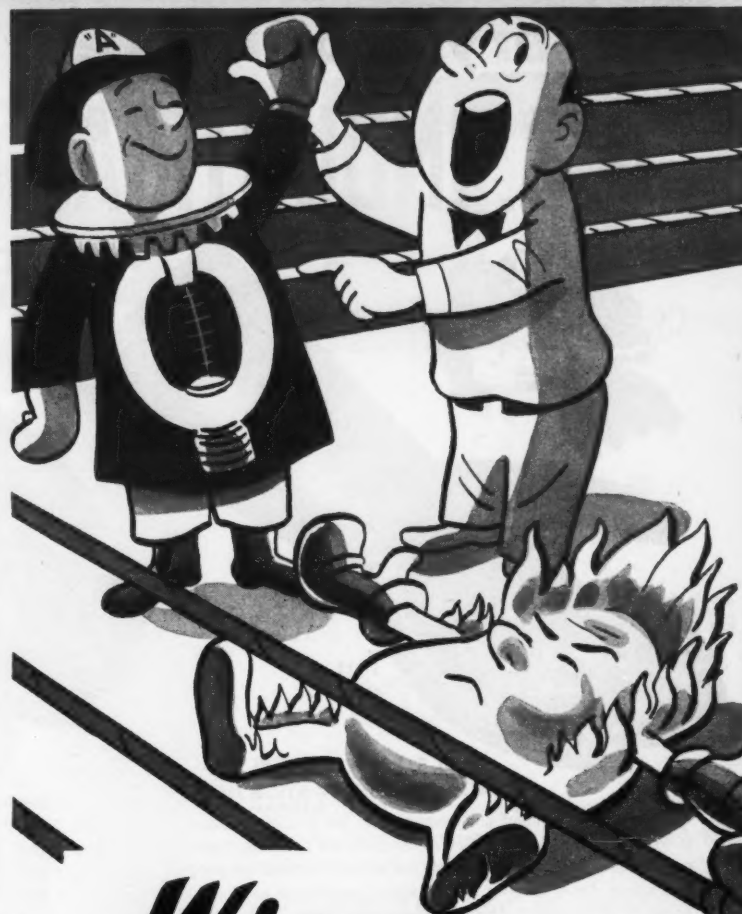
combines least toxic materials, won't leave flammable vapors

**Uses:** For the cleaning of electrical equipment such as wiring, fuses, motors, and switches. For in-plant maintenance cleaning where a high-flash material is required.

**Features:** Quick-drying solvent combines least toxic solvents available, consistent with safety from fire hazard. Material is said to quickly and effectively remove all deposits of grease, oil, metallic particles, carbon dust and other causes of dangerous flashovers. It leaves no oily residues and no after-neutralization.

**Description:** Solvent cleaner is non-corrosive and is safe for use on all metal and wood surfaces, and on well-bonded paint. It has a Tag closed cup flash point of over 200°F. It will not leave flammable vapors or residues upon evaporation. Since it is non-conductive, solvent can be used to clean motors while they are hot. It is applied by non-atomizing low pressure spray or brush.

(Turco-Solv solvent cleaner is a product of Turco Products, Inc., Dept. CP, 6135 S. Central Ave. Los Angeles 1, Calif. . . . or for more information check CP 7752 on handy form, pages 2 and 3.)



## Winner EVERY TIME!

"Automatic" SPRAY Sprinklers are a sure Winner every time that they're called on to save lives, property and money. They extinguish more fire with less water, permit wider spacing of sprinklers, and — fewer heads means lower installation cost.

It will pay you to invest in a Winner — "Automatic" SPRAY Sprinklers. Available in either upright or pendent style, they're approved protection for both Ordinary and Extra Hazard occupancies — cost no more than old style sprinklers.

Automatic Sprinkler CORPORATION OF AMERICA

YOUNGSTOWN, OHIO  
Offices in principal cities of North and South America

Want complete Facts? Write for Bulletin 70. It's FREE!

When inquiring check CP 7753 on handy form, pgs. 2-3



For every job in every industry...

# U.S. INDUSTRIAL GLOVES



STYLE  
NO. 1375

## U. S. ROYAL NEOPRENE COATED CANVAS WITH NYLON FINISH

Combines safety, comfort and economy with the amazing qualities of Neoprene. Neoprene withstands oils, acids and corrosive chemical solutions. Resists heat, sunlight and abrasion without softening or cracking. Resists cutting. Curved finger construction and flannel lining for extra comfort. Also available in other styles and constructions. Color—Black. One size only.

## PROVEN BEST BY WEAR TEST



STYLE  
NO. 1405

## U. S. DURA-GRIP PLASTIC COATED CANVAS

Specially compounded vinyl coating gives these gloves super abrasion-resistant qualities. Curved finger construction, flannel lining for extra comfort. For handling cement blocks, lumber, metal bars and pipes, etc. Color—Yellow. One size only. Also available in other styles for different uses.



STYLE  
NO. 129

## U. S. GRIP-SURE

Made of pure natural rubber latex. Ideal for canning and other light industrial uses. Highly resistant to most fruit and vegetable acids. Tough, yet extremely flexible. Specially designed pattern on fingers and palm for extra gripping qualities. Sizes 7 to 10 including half sizes.



STYLE NO. 102  
LIGHT WEIGHT

STYLE NO. 1398  
HEAVY WEIGHT

## U. S. INDUSTRIAL NEOPRENE UNLINED GLOVES

Made of specially compounded Neoprene to withstand oils, acids and other corrosive chemical solutions. Made with curved fingers. Extra roughened surface for positive grip. Scientifically developed to give utmost in safety, comfort, and economy. Also available in other styles.



UNITED STATES RUBBER COMPANY • Rockefeller Center, New York

When inquiring check CP 7754 on handy form, pgs. 2-3

## SAFETY

### Dual respirator can be used for organic vapors or dust

**Uses:** For protection against organic vapors or dust.

**Features:** Can be converted for use against organic vapors or dust by simply unscrewing retainer caps and inserting proper cartridge.

**Description:** As respirator for dusts, it has twin wool-felt filters with high filtration factor. Entire surface area of each filter is usable because there are no outer screens or covers.



As respirator for organic vapors, it has twin 85 cc cartridges with inhale and exhale check valves to prevent rebreathing.

Facepiece is contoured of soft rubber to provide snug, comfortable, leakproof fit without heavy tension on the two adjustable headbands.

(Respirator is product of Chicago Eye Shield Co., Dept. CP, 2300 Warren Blvd., Chicago 12, Ill. . . . or for more information check CP 7755 on handy Reader Service slip which is located between pages two and three.)

### Canister-type gas masks outlined in bulletin

Bulletin describes applications of canister-type gas masks. Included are such subjects as canister construction and life, methods of determining gas concentrations, heating and humidity, and recommended equipment for specific hazards in fire-fighting, agricultural, and chemical fields.

Bul 541 is issued by Acme Protection Equipment Co., Dept. CP, 3037 W. Lake St., Chicago 12, Ill. When inquiring specify CP 7756 on handy form, pages 2 and 3.

## SAFETY

### Safe handling of butadiene covered in report

Fire and explosion hazards exist in handling butadiene as result of material's physical properties (boiling point 4.7°C and explosion limits 2-11.5% by volume in air). Safety data sheet gives recommendations for procedures to be followed in unloading, storing, handling, and waste disposal. First aid measures are also included in the 16-page report.

Data Sheet SD-55 is available by remitting 25 cents direct to Manufacturing Chemists' Association, Department CP, 246 Woodward Building, Washington 5, D. C.

### Wood blocks made fire retardant with easily applied coating . . .

prevents absorption of oil or grease

**Uses:** As a coating or filler for wood blocks to retard ignition.

**Features:** Coating also waterproofs and is itself not affected by strong cleaning detergents.

**Description:** Product is non-flammable pitch in an emulsified form. It is spread over wood blocks by means of a brush or squeegee. Being oil and acid proof, it prevents the absorption of oil and grease by wood blocks. One 55-gal drum will protect 3000 to 4000 sq ft.

(Meco "73" is a product of Maintenance Engineering Co., Dept. CP, 16 W. Johnson St., Philadelphia 44, Pa. . . or for more information reader may simply check CP 7757 on handy Reader Service slip, pages 2 and 3.)

### Safety solvent line is non-corrosive, has low flammability and toxicity . . .

six solvents are available which offer a variety of drying rates

**Uses:** Cleaning or degreasing by soak, wipe, brush, or spray method.

**Features:** Solvents contain no corrosive elements which might affect metals. Flash points are relatively high. Toxicity is low, as compared with  $CCl_4$  and other chlorinated solvents. Dermatitis effects are negative, manufacturer states.

**Description:** Six Nocon Safety Solvents offer variety of drying rates and certain special qualities. All are in liquid form and are water white. Sp gr ranges from 0.8 to 1.5, depending upon solvent.

(Safety solvents are a product of Nocon Products Corp., Dept. CP, 62 Williams St., New York 5, N. Y. . . or for more information reader may simply check CP 7758 on handy Reader Service slip, pages 2 and 3.)

# FASTER MORE EFFECTIVE... MORE DEPENDABLE FIRE-STOPPING POWER



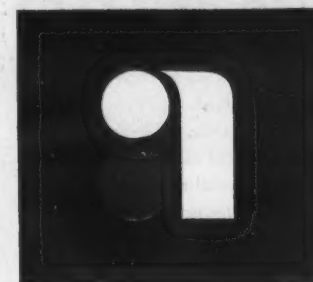
MODEL 20-B



**ANSUL**

*Chemical Company*

FIRE EQUIPMENT DIVISION • MARINETTE, WISCONSIN



## ANSUL FIRE EXTINGUISHING EQUIPMENT

**FASTER . . .** A short, quick downward motion of the puncture lever pressurizes the extinguisher and it is ready for instant use.

**MORE EFFECTIVE . . .** Even the inexperienced operator gets near-expert results because of the ease of operation and handling. In addition ANSUL "PLUS-FIFTY" Dry Chemical has greater fire-killing power.

**MORE DEPENDABLE . . .** Exclusive ANSUL-ENGINEERED design features include water-tight and corrosion-resistant construction, easy, on-the-spot recharge without special tools and other exclusive Ansul developments which insure greater dependability.

**FIRE-STOPPING POWER . . .** ANSUL FIRE EXTINGUISHERS have the highest ratings for fire-stopping power ever awarded any type of class B and C fire extinguishing equipment.



Send for File No. B-203. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.

OFFICES AND DISTRIBUTORS IN PRINCIPAL CITIES IN THE U. S. A., CANADA AND OTHER COUNTRIES

MANUFACTURERS OF DRY CHEMICAL FIRE EXTINGUISHING EQUIPMENT, REFRIGERATION PRODUCTS, INDUSTRIAL AND FINE CHEMICALS AND LIQUEFIED GASES

When inquiring check CP 7759 on handy form, pgs. 2-3

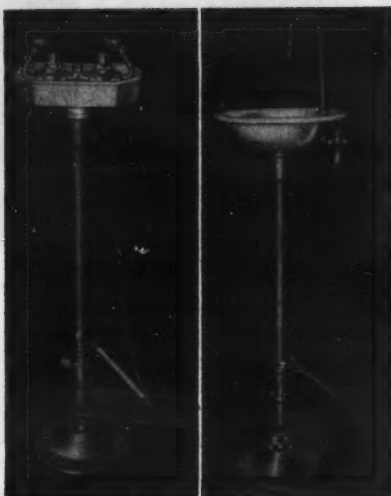


## TAKE EVERY PRECAUTION... TO SAVE PRICELESS VISION!

The HAWS Eye-Wash Fountain makes it possible for the worker himself to safely, easily wash injurious chemicals and foreign matter from the eyes before medical aid can be at hand. Has the potentiality of saving vision, reducing insurance claims.



AND to prevent dangerous and expensive eye accidents, encourage workers to wear goggles and plastic face shields by installing a HAWS Goggle-Wash Fountain—eliminates one of workers' main objections to wearing these safety devices.



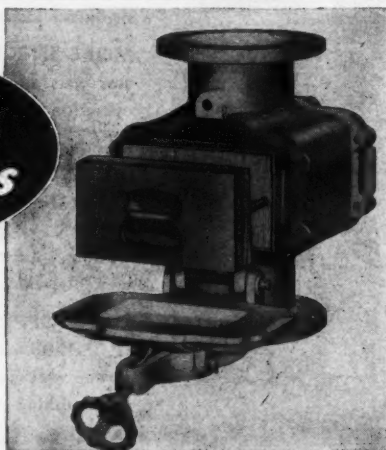
"Precaution" is really the cheapest thing you can buy!  
HAWS Safety Equipment costs only a few cents per worker.  
Write for literature today!

**HAWS DRINKING FAUCET CO.**  
1445 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

When inquiring check CP 7760 on handy form, pgs. 2-3

## OCECO Flame Arrestors

are a  
**DEPENDABLE  
Flame Stop**



● These arrestors combine the desired flame stoppage and explosion prevention with minimum pressure drop. Sturdy, rugged semi-steel housings and covers. Corrosion resistant aluminum "banks" have vertical straight through passages, minimizing clogging and simplifying inspection;—extensible for easy cleaning. 2" to 10" sizes. Write for Bulletin No. 471-R. It gives full details.

**OCECO TANK FITTINGS**  
THE JOHNSTON & JENNINGS CO.  
division of PETTIBONE MULLIKEN CORP.  
4751 West Division St. Chicago 51, Illinois

When inquiring check CP 7761 on handy form, pgs. 2-3

## SAFETY

### Skin protected from irritants encountered in processing...

Ointments form invisible film, do not impair tactile sensations

Two ointments have been developed for protecting skin against extreme exposure to industrial irritants. One of these, Clerex, protects against organic solvents and solvent-borne irritants. The other (Hydrepel-A and Hydrepel-S) protects against water solutions and water-borne irritants.

Clerex is protective gel containing a modified carbohydrate gum base which on drying forms a continuous strong elastic film adhering to skin. It is used to protect skin against paints, varnishes, adhesives, plastics, lacquers, degreasing solvents as well as in chemical plants using various solvents.

Hydrepels are plasticized combinations of ethyl cellulose and castor oil in mixed propanols with a water-repellent vanishing cream base. Hydrepel-S contains substantial proportion of silicone (dimethyl polysiloxane).

Both Hydrepel-A and Hydrepel-S resist a variety of substances including water solutions of salts, sugars, weak acids, weak alkalis, aldehydes, detergents, soap, proteins and other irritants. Their main value is resistance to water solutions but they also protect skin against airborne or tactile contacts.

(Clerex, Hydrepel-S, and Hydrepel-A are products of Hygiene Research Inc., Dept. CP, 684 Broadway, New York 12, N. Y. . . . or for more information check CP 7762 on handy form, pages 2 and 3.)

### Quick release of blast pressure effected by plastic windows...

panes blow out when internal pressure exceeds  $\frac{1}{4}$  pound per square inch

**Uses:** For quick release of pressure when blasts occur, eliminating build-up sufficient to blow out walls or window frames.

**Features:** Hazard of flying, sharp-pointed glass is reduced since panes do not shatter. When installed, panes withstand wind velocities up to 85 mph, but yield at internal pressure of  $\frac{1}{4}$  psi.

**Description:** Windowpanes are supplied as clear transparent sheeting extruded of cellulose acetate butyrate plastic. To provide added rigidity and to prevent pulling loose from the casing under high winds, panes are usually bound with a  $\frac{3}{8}$ " edging 22-gage galvanized steel or aluminum channel.

Sheeting can be purchased from custom extruders and cut to size on an ordinary paper shear, or panes may be purchased already cut to size and with and without bound edging strips.

(Windowpanes are fabricated from Tenite II which is marketed by Eastman Chemical Products, Inc., Div. of Eastman Kodak Co., Dept. CP, Kingsport, Tenn. . . . or for more information check CP 7763 on handy form, pages 2 and 3.)

## FOR COMPLETE PROTECTION AGAINST...



Styles illustrated  
50-00 Jacket  
51-05 Pants  
53-15 Hat

## Protective Clothing

by **Sawyer**

**Wears like iron** — takes endless rubbing, scraping, snagging, and still gives full protection.

**100% Waterproof** — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.

**Positively** will not blister, crack or peel. Its longer lasting quality means greater economy.

**Also:** Three-quarter and long coats, aprons, coveralls and many other styles. All clothing made in black or yellow.

**THE H.M. SAWYER & SON CO.**

Cambridge, Massachusetts

When inquiring check CP 7764 on handy form, pgs. 2-3

CHEMICAL PROCESSING



**Edmont Case No. 329:** Cleaning and acid-etching fabricated cab sections for cranes and shovels, prior to painting. A hazardous operation with ordinary unlined gloves because of the sharp metal edges. Edmont No. 922 gauntlets have been

safely used for years. Their NEOX (reinforced neoprene) coating resists cuts and snags as well as etching acid; their flannel lining prevents skin irritations. For further economy, right and left hand gloves are individually replaced when worn out.

### On big power shovels . . .

## Preparing metal for paint is no problem, with job-fitted gloves

If you bought a big power shovel or mobile crane, to work outdoors in every kind of weather, you'd want it to have one of the best protective paint jobs money could buy.

To provide that kind of paint job on its famous "Lorain" cranes and shovels, The Thew Shovel Company pre-treats its fabricated sections with acid, which insures a strong bond for the paint.

The problem of handling the sharp-edged sheets and plates in the acid, 8 hours a day, without hand injuries or skin irritations, is no problem at all. For years, Thew's safety and cost-conscious management has standardized on job-fitted Edmont gloves. The glove used on this operation is coated with cut-resistant, acid-proof NEOX. It has a good grip, is flexible and comfortable to wear. As always, this job-fitted glove has minimized costs through longer wear, safer work handling, and resulting employee satisfaction.



NEOX, natural rubber and plastic coatings Over-all coated or palm coated - 34 types

**Free Test Offer:** We are interested in helping you fit the correct gloves to your jobs. Send a brief description, on your business letterhead, of your operation, materials handled and temperature conditions. Without cost we will recommend and forward samples of gloves, for job-testing. Our laboratory also develops special gloves for conditions which our 34 standard types do not meet.

Edmont Manufacturing Co., 1204 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves, available through all leading industrial suppliers.



## Edmont job-fitted gloves

When inquiring check CP 7765 on handy form, pgs. 2-3

### SAFETY

#### Safety switch enclosure has rugged construction

**Uses:** As enclosure for safety switches and circuit breakers where humid, dust-laden, and corrosive atmospheres prevail.



**Description:** Lead-plated, sheet-steel enclosures are designed for outdoor use and other special applications where cast-iron was previously used. Inert lead coating resists corrosive effect of acid, alkali and salt spray.

(Enclosures are a development of Trumbull Components Dept., General Electric Co., Dept. CP, Plainville, Conn. . . . check CP 7766, pages 2 and 3.)

#### Lightweight spectacles provide that ounce of prevention . . .

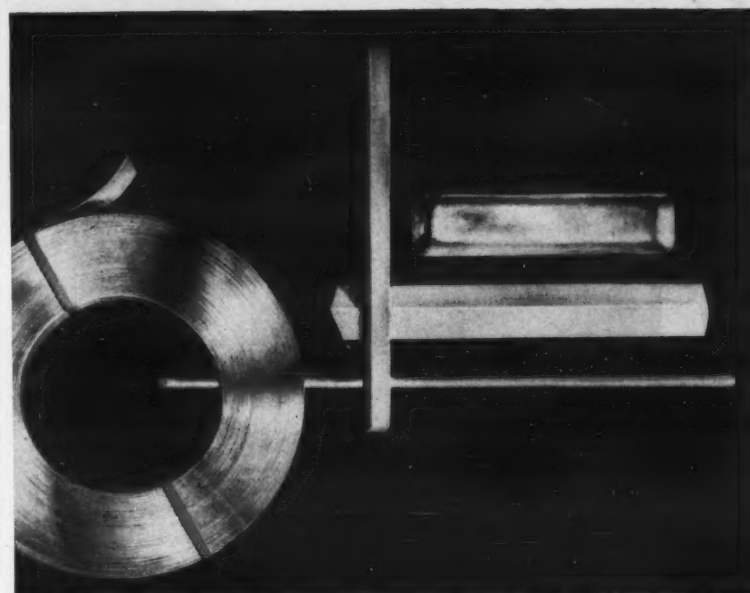
shatterproof methacrylate lenses easily replaced

Shatterproof, multi-purpose safety spectacles weigh little more than an ounce and are said to give almost 100% protection from eye injuries.

Over-eyes protection from glare and flying particles is provided by built-in visor, an extension of frame, shaped to fit wearer's forehead.

Injury from side or bottom is prevented by "semi-cup" lenses, so called because of lens flanges extending from lenses toward the cheek. Spectacles are single frame style that fits all workers.

("Visor-Tuc" Eye Savers are a product of Watchemoket Optical Co., Inc., Dept. CP, 232 W. Exchange St., Providence, R.I. . . . or for more information check CP 7767 on handy form located between pages 2 and 3.)



### FOR CORROSION RESISTANCE PLUS SERVICEABILITY, SELECT BERYLCO BERYLLIUM COPPER

**If** a high-copper alloy is your best defense against a corrosive condition, be sure to specify a material that gives you the utmost in final properties and ease of fabrication along with corrosion resistance—Berylco beryllium copper.

Berylco is remarkably resistant to both fresh and salt water, marine and industrial atmospheres, many alkalis, acids, organic media and gases. Stress corrosion cracking—or season cracking—is not a factor with beryllium copper, nor is corrosion fatigue.

Berylco (97% copper content) also offers greater strength (tensile 175,000 psi), conductivity, and ease of fabrication than any other copper-base alloy. Berylco is age hardenable; it is easily machined or formed while soft, then hardened by a simple low-temperature heat treatment for high final properties. Available for quick delivery in wrought forms or as casting ingot.

If you'd like more details on the corrosion resistance of Berylco, write for the free 4-page folder "The Corrosion Resistance of Berylco Beryllium Copper: A Digest."

### THE BERYLLIUM CORPORATION

Dept. 4D • READING 22



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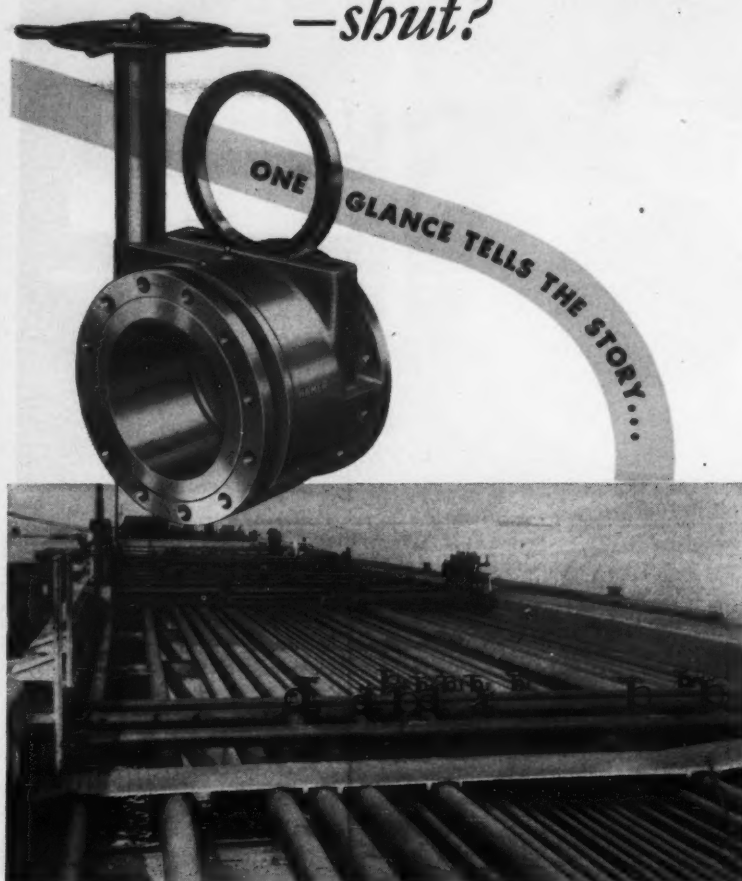
Representatives in principal world-trade centers

When inquiring check CP 7768 on handy form, pgs. 2-3



*Lines open?*

*—shut?*



## HAMER *Visible Shut-off* LINE BLIND VALVES

### HAMER Plug Valves

Standard dimensions... easy to substitute in existing installations. There's a HAMER non-stick Plug Valve for any requirement.



Don't guess—With the Hamer Line Blind Valves you know instantly at a glance which lines are open and which are shut. If the open end of the spectacle plate is up, the line has a permanent, positive shut-off... blank end up indicates a round, full open line. And Hamer Line Blind Spectacle Plates are easily visible from a distance... no need for individual valve checking. An enclosed plate slot on the Hamer Valve eliminates product waste while spectacle plate is being reversed—stops mess, reduces fire hazard.

Send for free catalog.

## HAMER OIL TOOL COMPANY

2919 Gardenia Avenue  
Long Beach 6, California

Representatives throughout the United States

When inquiring check CP 7769 on handy form, pgs. 2-3

*processing  
equipment*



Angular mixer used at Carpenter-Morton in operation (above) and with agitator tilted (left)

At Carpenter-Morton Co., manufacturers of high grade enamels and industrial finishes—

***marked improvement in color dispersions  
results from use of angular mixer***

**Heavy paste, having consistency of putty, handled by unit that eliminates roller milling in some cases**

**Problem:** At Carpenter-Morton Co., Everett, Mass., manufacturers of industrial coatings and decorative enamels, equipment in use did not provide necessary color dispersion in high viscosity pastes. Streaking was encountered in some cases. Quite a few mixers had been tried, none of which met requirements. Major prob-

lem was to control consistency of paste so that a better grind would be obtained when material was roller milled. In order to do this, equipment was needed which could handle a heavy mix.

**Solution:** Production manager heard that angular mixers were being successfully used in ink manufacturing to handle an extremely heavy paste. He visited an ink plant in New York City where this mixer was in operation. He was impressed with the strong construction of this mixer, particularly the agitator blade.



After a thorough investigation, an angular mixer was acquired and placed in operation at Carpenter-Morton Co. This unit utilizes a diamond-shaped agitator and a change tank which revolves on a turntable. Agitator sweeps sides and bottom of tank and folds over contents from side to center. Separate two-speed drives permit independent or combined operation of agitator and turntable at different speeds. Agitator can be made to rotate in either direction. At this company, agitator and turntable are operated in opposite directions so that maximum shearing action is obtained.

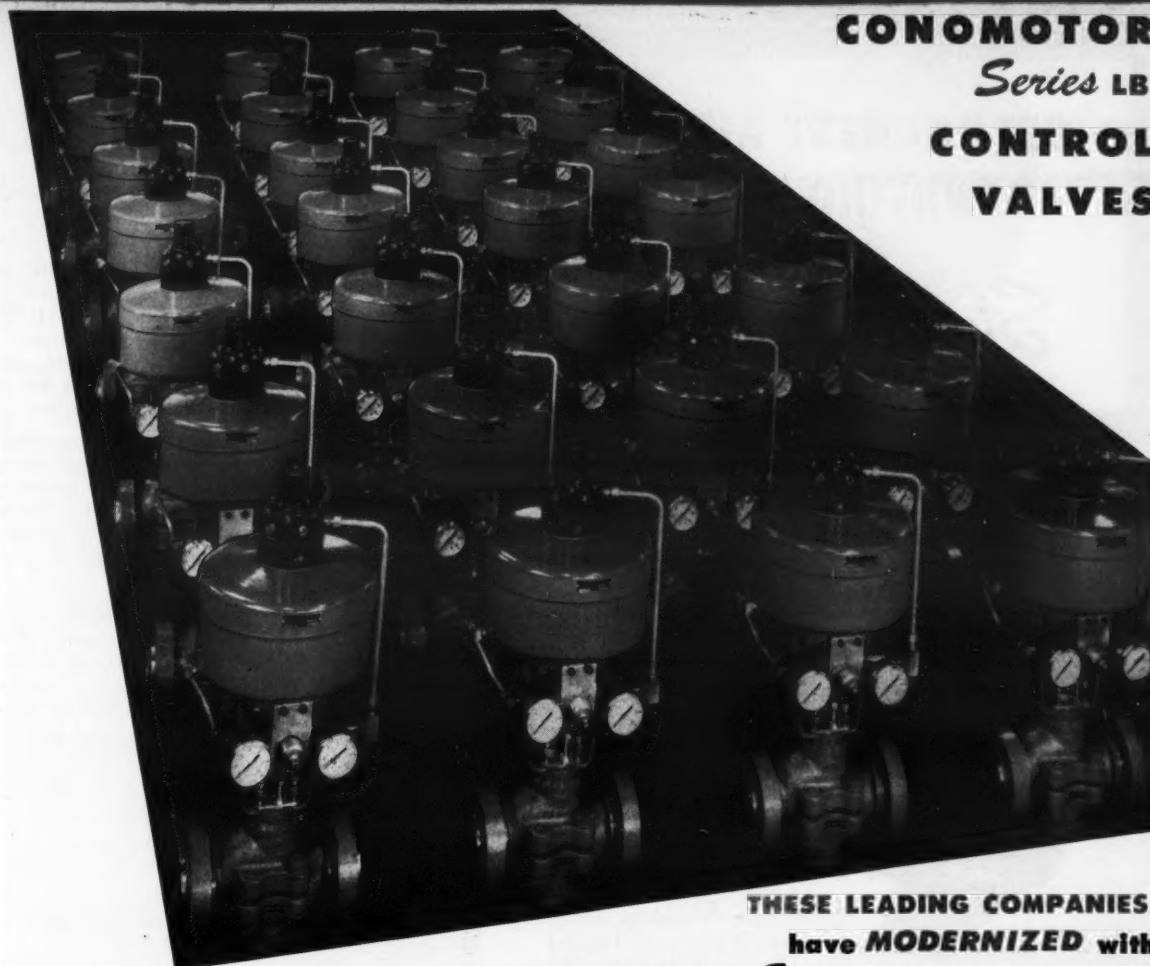
Unit is furnished with a power-actuated tilting device. After mix is complete, agitator is raised, and change tank removed with a mono-rail hoist. While in operation, cover encloses top of mixer. Small opening near front is equipped with door and latch.

**Results:** Since the angular mixer was placed in operation three years ago, a marked improvement has occurred in color dispersions, especially on colors difficult to disperse. Improvement has been noted in particular on deep shades such as greens or chocolate where a number of different pigments are used. Lighter colors are better since contamination is prevented by cover on mixer. Streaking has also been eliminated.

Primary advantage of mixer is that it can handle a very heavy paste. For example, it is used for the manufacture of Carpenter-Morton's wood filler, which has the consistency of putty. Moreover, with this material and some other products, complete operation is accomplished by mixing, eliminating need for roller milling in these cases.

With other products a heavy body is built up in mixer, facilitating production. As the paste in-

(Continued on next page)



## CONOMOTOR Series LB CONTROL VALVES

THESE LEADING COMPANIES  
have MODERNIZED with  
CONOMOTOR Series LB CONTROL VALVES

Progress cannot be denied! Naugatuck Chemical Division of U. S. Rubber Company has completely equipped a new plant with Conomotor Series LB Control Valves for temperature control on reactors. U. S. Steel is using a large quantity of these valves for various services in their new coal chemical facilities in the midwest. E. I. du Pont use Conomotor Control Valves for their complete valve equipment in a new pilot plant at their Eastern Regional Laboratories. Armstrong Cork Co. has standardized on Conomotor LB Valves for an extensive modernization program. These important decisions were based on thorough evaluation of design, performance and cost. When companies of this caliber approve and adopt a new advance in process control, you can rely on their judgment. These and other new installations are typical of the important part Conoflow final control elements play in the modern industrial evolution to automatic control. Whether you have a new plant or plan to modernize your old plant it will pay you to talk to Conoflow.

- Armstrong Cork Co.
- Bakelite Company
- Colgate-Palmolive Co.
- Curtiss-Wright Corp.
- E. I. du Pont de Nemours & Co., Inc.
- Emery Industries, Inc.
- General Electric Co.
- Heyden Chemical Corp.
- Naugatuck Chemical Division U. S. Rubber Co.
- Philadelphia Electric Co.
- Publicker Industries, Inc.
- Jos. Schlitz Brewing Co.
- Sharples Corp.
- The Sherwin-Williams Co.
- U. S. Steel Corp.
- Victor Chemical Works
- Westinghouse Electric Corp.

WRITE FOR CATALOG LB-1, "PORTENT OF THINGS TO COME"

*Cono Controls*

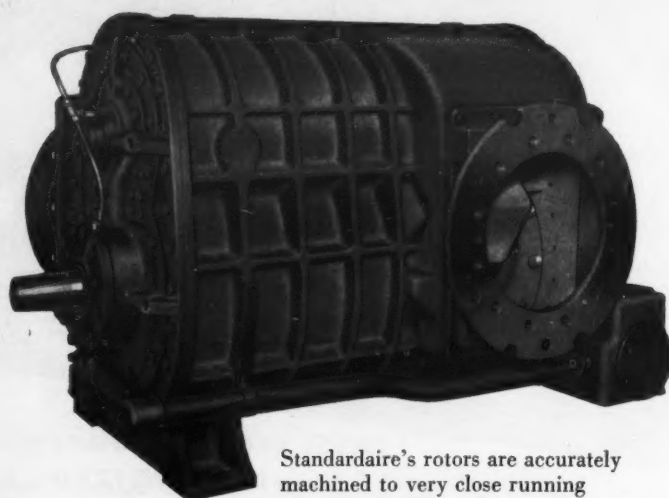
**CONOFLOW CORPORATION**  
FOREMOST MANUFACTURERS OF FINAL CONTROL ELEMENTS  
2100 ARCH STREET, PHILADELPHIA 3, PA.

When inquiring check CP 7770 on handy form, pgs. 2-3



## GET HIGHEST AIR OR GAS HANDLING EFFICIENCY

WITH  
**Standardaire® Blowers**



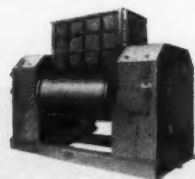
Standardaire's rotors are accurately machined to very close running tolerances and provide a continuous sealing through the entire length of their engagement. Thus, the high pressure gas or air is confined at the discharge end of the Blower and leakage lines are much shorter than on other types of units.

The Standardaire Blower employs an exclusive principle of compressing air or gas on a modified adiabatic cycle. This provides a wide range of pressures with a minimum of internal losses.

This compact, light weight Blower gives you a greater output per pound weight than any other blower of this type.

Get all the facts today . . . write:

Read Standard also manufactures a complete line of chemical mixers for laboratory and industrial use.



**READ STANDARD**  
CORPORATION

**BLOWER-STOKER DIVISION**  
370 Lexington Avenue  
New York 17, New York

4-54

When inquiring check CP 7771 on handy form, pgs. 2-3

## PROCESSING

(Continued from preceding page)

creases in viscosity, the gel suddenly breaks. Material can then be easily handled on a roller mill. Unit premixes enough paste to keep two to three roll mills in operation, manufacturing Carmote line of high grade enamels and industrial finishes.

All of experimental plant work on mixing has been conducted on angular unit because of its ability to handle a heavy mix. It has been of particular advantage in development of company's industrial coating, Ryolite, an alkyd resin and phenolic base finish, designed for control of corrosion in the chemical and allied industries.

Angular mixer comes as a complete, compact unit. All that is necessary for installation is an electrical hookup. It can be easily moved to a different location if necessary. Two individual mixing methods permit control of speed as required. Improved grinding is facilitated by accurate speed control.

One operator is able to handle the angular mixer as well as some other units. Machine can be quickly cleaned by scraping down sides of one large blade. Maintenance costs have been low, no unusual difficulties having been encountered.

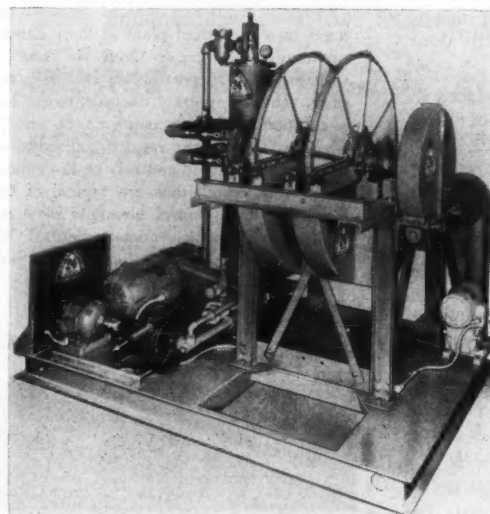
(Angular mixer is product of Troy Engine & Machine Co., Dept. CP, Troy, Pa. . . or for more information check CP 7772 on handy form, pages 2 and 3.)

### Little floor space is required with integral disc filter . . .

unit can be installed or relocated quickly

**Uses:** As a complete disc filter unit.

**Features:** Relatively little floor space and head room are required. All wiring and piping is integral to unit, permitting easy installation or relocation.



Disc filter unit is self-contained

## SPRAY NOZZLES

for chemical  
spraying,  
cooling,  
humidifying,  
dehydrating,  
and hundreds  
of other  
applications.

You'll get the  
right nozzles  
quicker by  
calling Binks...  
manufacturers  
of one of the  
most complete  
selections  
ever produced.

A wide range of spray patterns, sizes, capacities...with nozzles cast or machined from standard or special corrosion-resistant metals.

### MAIL COUPON NOW!

Binks Manufacturing Company  
3120-32 Carroll Ave., Chicago 12, Ill.  
O. K. Binks, send me your  
Spray Nozzle Catalog... FREE!

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**Binks**  
MANUFACTURING CO.

A COMPLETE LINE OF  
INDUSTRIAL SPRAY NOZZLES  
AND COOLING TOWERS

When inquiring check CP 7773  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

## PROCESSING

From two to five rotating discs may be placed in a single unit, depending upon specific requirements.

**Description:** Packaged disc filter unit has all de-watering elements located on one base. Two-disc unit pictured has base measuring 5'8" x 9'10". It is 7'10" high and weighs 5500 lb. Additional discs increase length of unit 14" over dimension given above. Drum filter may be substituted for discs, if desired. Sufficient space has been allowed under discs so a conveyor may be added to remove filtered product. Units are custom made to handle individual filtering operations.

(Packaged disc filter units are available from Denver Equipment Co., Dept. CP, PO Box 5268, Denver 17, Colorado . . . check CP 7774, pages 2 and 3.)

### Small-size centrifugal strainer takes oversize particles from process streams . . .

unit has continuous flow from one to 100 gpm capacities



**Uses:** As continuous strainer of oversize particles in process streams.

**Features:** Unit is compact and consumes little power. It is designed to handle fibrous or viscous slurries. Motor-driven scrapers (or brushes) prevent particles from plugging openings.

**Description:** Bantam strainer pictured measures 14 x 17", and is 15" high (including motor). It has capacity of from 1 to 100 gpm, depending upon type of application. Unit operates on continuous-flow principle.

(Bantam Strainer is a product of Merco Centrifugal Co., Dept. CP, 150 Green St., San Francisco 11, Calif. . . . check CP 7775, pages 2 and 3.)

### Tells features, applications of molding presses

Complete line of automatic and semi-automatic molding presses, for preforming and extrusion, are described in eight-page catalog. Specifications are included for 50 and 300-ton straight-ram compression and transfer molding presses, and for a toggle-action compression press. Special features and recommended applications for various presses are detailed.

Cat 525 is available from F. J. Stokes Machine Co., Dept. CP, Philadelphia 20, Pa. When inquiring specify CP 7776, pages 2 and 3.



## WELDING FITTINGS for CHEMICAL PROCESS Service

### QUALITY Stainless Steel Butt Welding Fittings in Schedule 5 - 10 - 40 and tube O. D. Sizes from 1/2" through 24" and 36"

• TRI-CLOVER offers the most complete line of Zephyrweld Schedule 5 and 10 stainless steel welding fittings in sizes from 1/2" through 24" and 36" for use with stainless steel light gauge pipe and tubing. In addition, Schedule 40 fittings are available in sizes through 24".

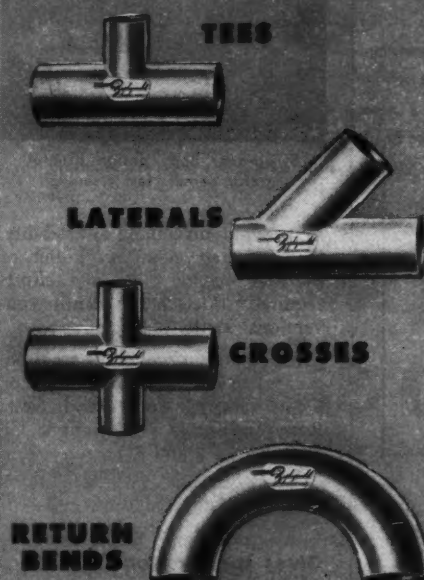
These quality fittings are annealed, pickled and passivated in sizes through 4". Larger sizes are passivated and may be annealed upon request.

Employing modern, unique and proved methods throughout, these porosity-free fittings are fabricated from stainless steel types 304, 347, 316 and other stainless steel analyses.

Schedule 5 and 10 fitting ends are cut flush for rapid welding. Because of their light gauge, no chamfering is required. Schedule 40 fittings are beveled in accordance with ASA specifications. Fittings can be flame cut for disassembly, used again by re-welding.

See your nearest distributor for full details.

**EXPORT DIVISION:** 8 So. Michigan, Chicago, U. S. A.



... Included in the Zephyrweld fittings line are reducers and adapters to permit their use with practically every other known type of fitting.

### WRITE FOR CATALOGS

Send for CATALOG 748, covering welding fittings for O.D. tubing—or for CATALOG 1051, covering Schedule 5-8 and 10-8 fittings for light gauge pipe.

**Tri-Clover**  
MACHINE CO.  
Kenosha, Wisconsin

TRI-ALLOY AND STAINLESS STEEL  
SANITARY FITTINGS, VALVES,  
PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL  
INDUSTRIAL FITTINGS AND  
INDUSTRIAL PUMPS

THE Complete LINE

PI-152R

When inquiring check CP 7777 on handy form, pgs. 2-3



## Get your name on the list to receive FILTER FACTS

● Shriver "Filter Facts" contains useful information for the user of filtration and fluids-handling equipment.

The current issue includes articles on "tricks of the trade" in filtration; the obsolescence factor in filter presses; pumping and filtration of food products; washing and drying filter cake; filter aid do's and don'ts; and other interesting practical items.

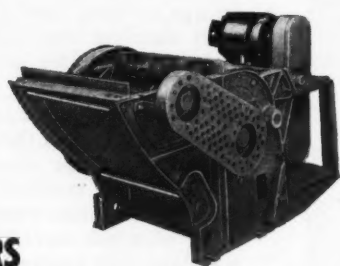
Write us for the current issue of "Filter Facts" and others to come.

**T. SHRIVER & CO., Inc.** 846 Hamilton St. • Harrison, N. J.  
Filter Presses • Filter Media • Diaphragm Pumps

When inquiring specify CP 7778 on handy form, pgs. 2-3

For  
**ACCURATE  
LOW-COST  
FEEDING  
and  
BLENDING**

### DRAVER FEEDERS



Accurate economical Draver Feeders feed dry powdered or granular materials in a positive, uniform, easily regulated stream. Used to control material flow to production units such as dryers, elevators, grinders and sifters, Dravers feed even stubborn, hard-to-handle materials at the right rate to get maximum efficient production without danger of overloading. You save power and time, eliminate choke-ups and excessive wear on your equipment—perhaps avoid wasteful reprocessing.

And, if uniform proportioning and mixing of dry materials are required in your process, two or more Dravers (one for each ingredient) will assure thorough blends to your formulas, with minimum production costs. With over 100 sizes and models in the complete line, there is a standard Draver Feeder for practically every dry feeding requirement. Send data on your capacity regulating or blending requirements and let our engineers make recommendations and quote prices—without obligation, of course.

**B. F. GUMP Co.** 1344 So. Cicero Avenue, Chicago 50, Illinois

When inquiring check CP 7779 on handy form, pgs. 2-3

## PROCESSING

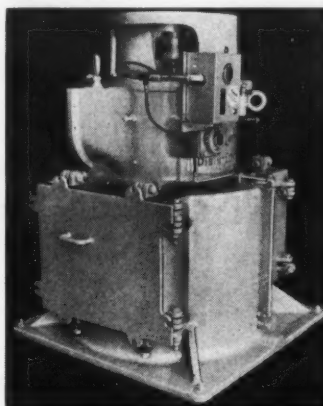
### Changing screens is easy in swing-door mill . . .

unit is waterproof, dust-tight

**Uses:** Intended for use in size-reduction and dispersion operations of food and chemical process industries.

**Features:** Swing-door body design provides completely waterproof and dust-tight unit for processing liquids or finely divided solids, permits fast cleaning of interior and changing of hammers or screens.

**Description:** Two swing-doors are installed on either side of unit



Swing-door body design disintegrator permits fast cleaning

to provide maximum accessibility. Doors merely swing back out of the way, saving time and efforts required to detach and handle conventional skirts.

(Swing-door disintegrators are products of Rietz Manufacturing Co., Dept. CP, 150 Todd Road, Santa Rosa, California . . . check CP 7780, pages 2 and 3.)

### Gives specifications of mixers, hoppers

Processing equipment including bins, hoppers, conveyors, sifters, elevators, various mixers, and blowers are discussed in 12-page illustrated bulletin. Tables and charts give specifications.

Bul 53759 is issued by Read Standard Corporation, Dept. CP, York 1, Pa. Specify CP 7781, pages 2 and 3.

## ACE-HIDE

UNBREAKABLE  
RUBBER-PLASTIC  
3-GAL. PAIL



3-GAL. PAIL



1-QUART  
DIPPER

For handling corrosive solutions. Tough, resilient, practically indestructible. Made of a new synthetic rubber-base material called ACE-HIDE, unaffected by most acids and alkalis. Drip-proof spout pours easily directed stream. Graduated scale inside pail. ORDER NOW from your rubber goods distributor, or write us.

**ACE rubber and  
plastic products**

**AMERICAN HARD RUBBER COMPANY**

93 Worth St., New York 13, N. Y.

When inquiring check CP 7782 on handy form, pgs. 2-3

## COLTON FINEST QUALITY STAINLESS STEEL TANKS

ALL TYPES—STORAGE—PROCESS

## AGITATORS

ALL TYPES—PORTABLE—BUILT-IN

Write for Literature

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**COLTON**  
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Established 1887

Div. Snyder Tool & Engineering Company

3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

When inquiring check CP 7783 on handy form, pgs. 2-3

CHEMICAL PROCESSING

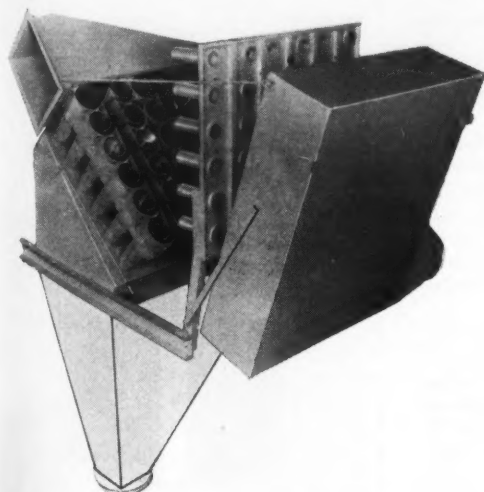
**Outlet hood and cover open  
when cleaning dust  
from collector . . .**

design cuts build-up or plugging, even with sticky or fibrous dusts

**Uses:** As dust collector.

**Features:** Hinged hood and cover can be opened by removing "T" handles. All internal surfaces are exposed for inspection and cleaning. Design minimizes dust build-up or plugging, even with dusts of sticky or fibrous nature.

**Description:** Dust collector is called the Micro-



Collector opens for cleaning

clone. Standard sizes are available to handle volumes from 70 cfm upward. Tubes and bodies are made of aluminum, carbon steel, or stainless, depending upon dust to be handled. Units operate on a controlled helical flow principle.

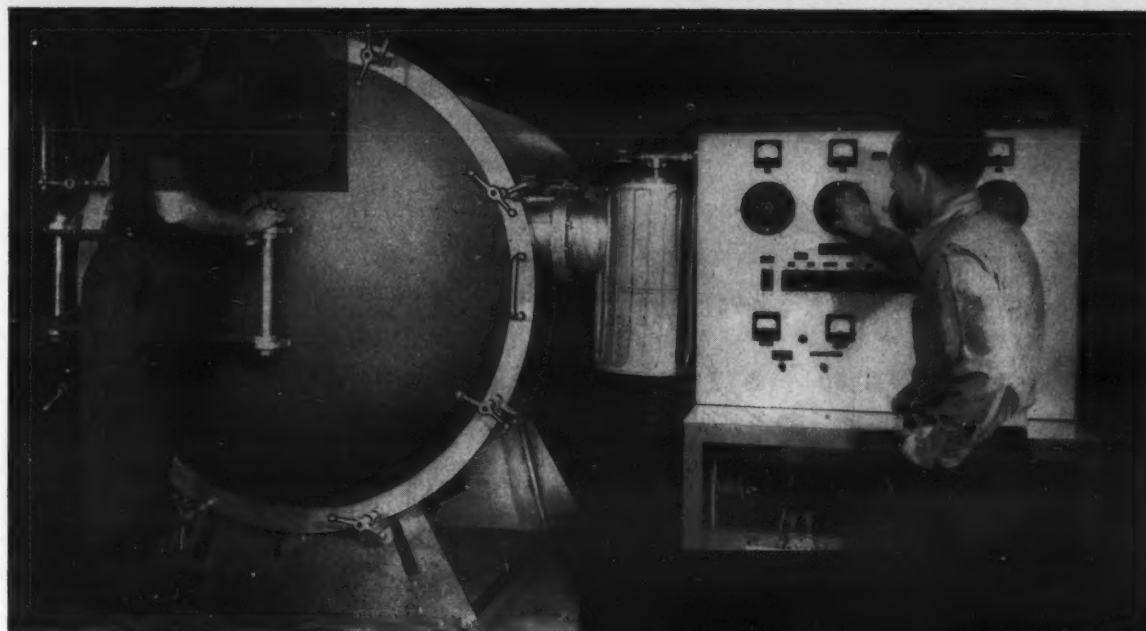
(Collectors are a product of Dustex Corp., Dept. CP, 1756 Walden Ave., Buffalo 25, N. Y. . . . or for more information concerning manufacturer's product, check CP 7784 on handy Reader Service slip located between pages 2 and 3.)

**Deplets separator operation**

Vibrating screen separators, including operational principles, descriptions, and applications, are pictured and described in eight-page catalog.

Four-color cut-away drawing shows inner details of separator. Operational data file, covering various industrial fields, accompanies catalog.

Data File 106-3 is issued by Sweco Separator Division, Southwestern Engineering Company, Dept. CP, 4800 Santa Fe Avenue, Los Angeles 58, California. When inquiring specify CP 7785 on handy Reader Service slip located between pages two and three.



Kinney High Vacuum Pumps (Models DVM 12.8.14 and VSM 5.5.6) are used on this machine — manufactured by Optical Film Engineering Company, Philadelphia, Pa. — for depositing coatings on precision optical lenses, jewelry, plastic novelties, and countless other products. The vacuum system employed by this processing package creates absolute pressures as low as  $10^{-6}$  mm. Hg. With this fast system, processing is carried out within a few minutes after loading, insuring maximum output per hour. Many of these coating machines are serving industries throughout the country.

## How to get the right vacuum pump

By consulting Kinney, you can choose from our line of 13 Single Stage and Compound vacuum pump models . . . the biggest, most versatile pump line on the market. We can help you size and apply these reliable high vacuum pumps to your vacuum processing operations. Our district offices are staffed with competent vacuum engineers, to assist you.

**SEND COUPON TODAY!**

### KINNEY MFG. DIVISION

THE NEW YORK AIR BRAKE COMPANY

3573 WASHINGTON STREET • BOSTON 30 • MASS.

☐ Please send Bulletin V-51B describing the complete line of Kinney Vacuum Pumps.

Name.....

Company.....

Address.....

City..... State.....

When inquiring check CP 7786 on handy form, pgs. 2-3

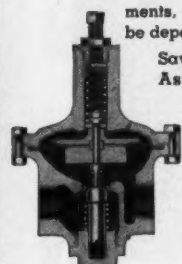




### Clark Pressure Reducing and Regulating Valves

are precision-made for positive pressure control on air, gas or steam lines. Where different types of equipment, with varying pressure requirements, are operated from a common line, Clark Regulating Valves can be depended on to deliver automatically the "just right" pressure to each.

Save on fuel, maintenance and protect expensive equipment. Ask your Clark representative to specify the right Clark valves for your needs . . . or write us direct.

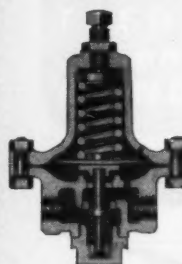
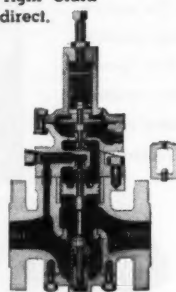


#### TYPE KRV

Pressure Reducing Valve. Diaphragm Operated - Single Seated Valve. Sizes  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " for initial pressures up to 250 P.S.I. Reduced pressures to 85 P.S.I.

#### TYPE CRV

Pressure Reducing Valve. Integral pilot controlled, piston operated. For pressure control from "dead end" to full capacity. Sizes  $\frac{1}{2}$ " to 6".



#### TYPE ORV

Pressure Reducing Valve.  $\frac{3}{4}$ " and  $\frac{1}{2}$ " Single Seated, Spring Loaded, Diaphragm Actuated. For initial pressures up to 250 P.S.I. Reduced pressures to 200 P.S.I.

#### QUICK-CLEANING STRAINERS

Remove dirt, scale and grit from steam, fluid and gas lines. Sizes  $\frac{1}{2}$ " to 3" I.P.S. For pressures to 250 P.S.I.



# Clark

MANUFACTURING COMPANY

1830 EAST 38th STREET  
CLEVELAND 14, OHIO

Distributors and Representatives in all major cities

When inquiring check CP 7787 on handy form, pgs. 2-3

## PROCESSING

**Mixing without aeration possible with bottom drive . . .**

facilitates charging and pressurizing of mixer



Mixer has bottom drive which is located between pages 2 and 3.)

**Uses:** For performing mixing, dissolving, and dispersing operations.

**Features:** Drive shaft of impeller is mounted beneath mixing tank. Air is prevented from following down shaft and aerating liquid in tank. Charging tank is easy. Pressurizing can be accomplished readily.

**Description:** Bottom drive Ultrafast Dissolvers (models 10UD and 20UD) are available with direct or gear drives. They come in a wide range of tank capacities.

(Bottom drive mixers are a product of the Cowles Co., Dept. CP, Trackside Place, Cayuga, N. Y. . . . or for more information check CP 7788 on handy Reader Service slip

**Unit has dual function — filters and conveys at same time . . .**

continuous tray belt filter is expected to have numerous applications in various fields

**Uses:** Can be used for fast filtering materials, for washing grains and salts, and for solids difficult to keep in suspension — such as coarse sand or materials devoid of supporting slimes.

**Features:** Sturdy mechanism operates continuously. Either direct or counter-current washing action is possible. Filter cloth is easily replaced. Unit can act as short conveyor as well as filter.

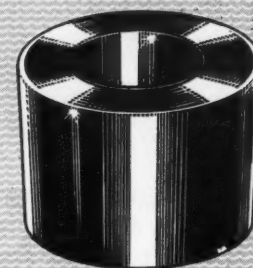
**Description:** Unit consists of a series of connected, traveling, perforated conveyor-like trays in contact with a suction box. An endless filter belt—supported by the trays but not attached to them—travels with the trays. Raw liquid-solid mixture is gravity fed to one end of conveyor. As mixture passes over suction box section, liquid is drawn through the cloth and trays, and out of the box. Suction is created by vacuum pump attached to the box.

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*Oilless*  
**BEARINGS**

*Specify*

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*Works Where Others Won't!*

- OPERATE DRY or SUBMERGED IN DYES; PLATING, CLEANING and CHEMICAL SOLUTIONS; GASOLINE; FOODSTUFFS
- TRULY OILLESS and SELF-LUBRICATING
- EXTREMELY DURABLE
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- APPLICABLE OVER A WIDE TEMPERATURE RANGE — even where oil solidifies or carbonizes
- EXTENSIVELY USED IN CONVEYORS, PUMPS and OVENS
- ROTATING SEALS OF GRAPHALLOY ARE UNEXCELLED

GRAPHITE METALLIZING CORPORATION

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Please send data on Graphalloy SUBMERGED OILLESS BEARINGS.

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COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

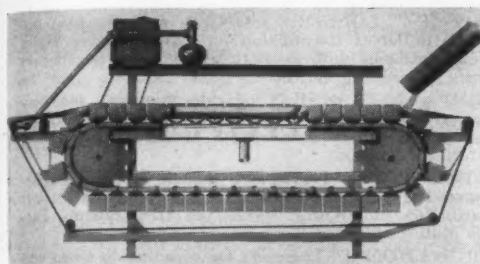
When inquiring check CP 7789 on handy form, pages 2-3

CHEMICAL PROCESSING

## PROCESSING

Filter cake continues to other end of conveyor where it drops off. Cloth continues its return travel under main filter tray section. Air may be applied to loosen cake and clean the cloth.

Washing action can be combined with filtration by use of water sprays above filter cloth. Counter-current washing action may be obtained in cases where fil-



Cut-away view of filter. Liquid-solid mixture is fed to moving cloth at right. Suction box (center) removes liquids. Filter cake is removed at left

trates are re-used with no dilution. This is done by dividing the suction box into sections and then (through separate pumping arrangements) passing the washing solution back over oncoming cake.

Drying can be accomplished by passing hot air or gas through cake as it passes over suction box.

(Tray Belt Filter is product of Hardinge Company, Inc., Dept. CP, 240 Arch St., York, Pa. . . . or for more information check CP 7790, pages 2 and 3.)

### Clear filtrate assured at all times by porous filter medium . . .

compact-designed filter may be steam-jacketed

**Uses:** Filters can be used for clarifying and removing solids from fluids such as water, petroleum products, and molten metals.

**Features:** Porous stainless steel filter medium is high-temperature resistant and is reported to assure clear filtrates at all times.

#### Description:

Filters are compactly designed, permit steam jacketing, are of easily-cleaned, sanitary construction, and withstand high pressures. Units are available with filter areas up to 720 sq ft and cake space capacity of 35 cu ft. Shell construction is either carbon or stainless steel.

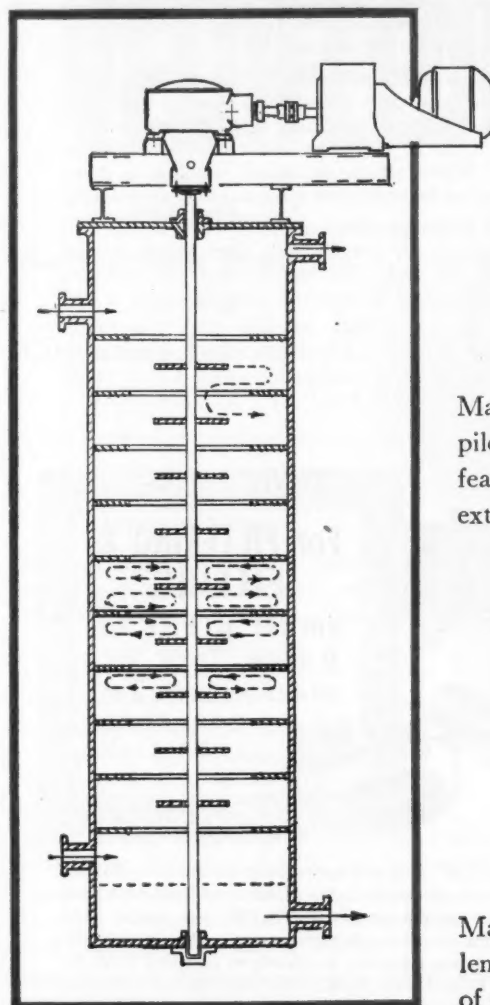


Filter permits easy cleaning

(Filters are product of Micro Metallic Corp., Dept. CP, Glen Cove, N. Y. . . . or for more information check CP 7791 on handy form, pages 2 and 3.)



**TURBO-MIXER, a division of  
GENERAL AMERICAN TRANSPORTATION CORPORATION**



\*Licensed under Shell  
Development Company patent\*



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General Offices: 135 S. La Salle St., Chicago 90, Illinois • Offices in all principal cities  
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DEWATERERS • TOWERS • TANKS • PRESSURE VESSELS**

## Turbo-Mixer R.D.C.\* Column

**Rotary Disc Contactor for  
Liquid-Liquid Counter-current Extraction**

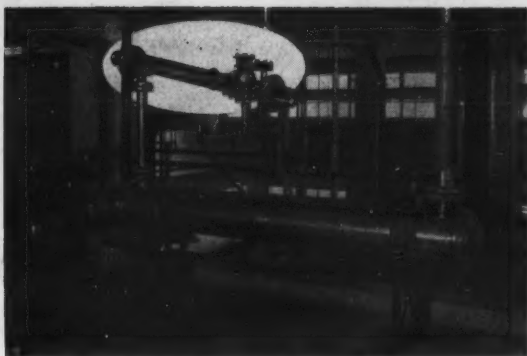
Many years of data and design development in the laboratory, pilot plants and industry have demonstrated the superior features of this practical counter-current and gravity flow extractor. The R. D. C. extractor offers:

1. high volumetric efficiency
2. high throughput capacity
3. simplicity of construction
4. no interstage or external settlers
5. low power requirements
6. flexibility of operation

May we assist you in the solution of your extractor problems? Our laboratory facilities are available for evaluation of your extraction system.

When inquiring check CP 7792 on handy form, pgs. 2-3





Unique two-stage solvent recovery system at Cudahy Packing Co., cuts losses to minimum.

## Pfaunder Heat Exchangers Save Solvent At Cudahy

You, too, can save money by letting Pfaunder engineers tackle your heat-exchanger problems.

For example, Cudahy Packing Co., using a highly volatile and costly solvent needed a recovery system that would minimize losses. Pfaunder came up with the two-stage assembly shown above. The large stainless-steel heat exchanger in the foreground does the major part of the job. But as solvents must be vented, a substantial amount could be lost.

So Pfaunder engineers designed a small second unit (circle) which is refrigerated. This condenses escaping vapors, recovering all but the irreducible minimum.

The heat exchangers used here were built from Pfaunder's unique flexible standard heat-exchanger plan. Balanced inventories of standard parts are maintained so that they can be adapted to the exact need. This saves time and lowers cost, too. *Delivery in 4 to 12 weeks!*

Let us discuss your next heat-exchanger problem with you . . . meantime, send for this data book.



All The Data You Need to work out heat-exchanger capacity and type problems is contained in this 40-page fact-packed Pfaunder manual. The tables, charts and curves are easy to follow. And it includes full details on Pfaunder heat exchangers. Mail the coupon for your copy.

# Pfaunder

Engineers and fabricators of corrosion-resistant process equipment

GLASSED STEEL — Hastelloy, Aluminum, Tantalum, Teflon, Carbon Steel, Solid or Clad Stainless Steel, Nickel, Inconel, Monel

THE PFAUDLER CO., Dept. CP-4, Rochester 3, N. Y.  
Please send me the Pfaunder Heat-Exchanger Manual No. 837.

Name .....  
Title .....  
Company .....  
Address .....  
City ..... Zone ..... State .....

When inquiring check CP 7793 on handy form, pgs. 2-3

## PROCESSING

**Vacuum necessary for filtration provided by internal legs of filtrate . . .**

valveless filter built for filtering, thickening, and washing uses in pulp and paper mills

**Uses:** Filter is primarily intended for filtering, thickening, and washing applications in pulp or paper mill.

**Features:** Filter has a self-contained vacuum source — internal water legs which carry filtrate from the filter surface to main effluent discharge line. No valves are needed on the filter. Rapid drainage is assured by air-release tubes and special construction of filter's radial cell walls.

**Description:** The Shartle Strindlund filter can be equipped with parts necessary to make it applicable to any washing or thickening job. When consistencies of 15 to 16% are required, pressure rolls can be used. When bleach or liquor washing is done, showers can be added and speed adjusted accordingly.

Filtrate discharge tubing can be replaced or repaired, if necessary, by getting into filter drum interior through one end. Air release tubes and cells can also be replaced or repaired from inside.

(Built by Shartle Bros. Machine Div., The Black-Clawson Company, Dept. CP, Middletown, Ohio . . . or for more information check CP 7794 on handy form, pages 2 and 3.)



### For FILTERING & FILLING

small plant or batch lots of  
PHARMACEUTICALS,  
COSMETICS,  
CHEMICALS,  
SOAPS, Etc.

Two Ertel units that make small production efficient. They have all the desirable features of Ertel high production equipment: EFS-B FILTER has single hand wheel for simple trouble-free operation, bronze or stainless circulatory system, accommodates accepted Ertel Asbestos Filter Sheets. PORTABLE FILLER has automatic overflow system, non-drip spouts, bottle size flexibility up to gallons. And, both units can be easily moved from place to place. Write for detailed information on this important equipment... it belongs in your plant.

**ERTEL ENGINEERING CORPORATION**

KINGSTON 3, NEW YORK  
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COMPLETE LINE OF  
**Liquid Handling Equipment**



When inquiring check CP 7795 on handy form, pgs. 2-3

## "National" Provides The Economical Solution To Any Drying Problem!

No matter what your product may be, it can be dried or processed at lower cost per pound in one of "NATIONAL'S" machines.

High-speed production; maximum use of drying medium under full control; adaptability to existing plant conditions and future expansion; and assurance of long, trouble-free operation are among the reasons why "NATIONAL" equipment is being installed in more and more chemical plants.

**NEW "P-4" CONSTRUCTION:** A radically new approach to dryer construction . . . assures more rigid, durable machine with as much as 50% less installation time.

**"ADD-A-UNIT" DESIGN** provides practical and economical alternatives—1. Simplified initial installation based on present requirements; 2. Maximum adaptability to future expansion.

**OTHER SPECIAL FEATURES** include Patented Super-Power Fans; greater versatility and precision in air distribution and control; special gas firing systems, *Factory Mutual approved.*

Call "NATIONAL" Engineers for consultation when you have a drying problem.

Chemical Dryers of  
All Types and Sizes



Special Drying and  
Heating Equipment

**THE NATIONAL DRYING MACHINERY CO.**  
2709 N. Hancock Street, Philadelphia 33, Pa.

When inquiring check CP 7796 on handy form, pgs. 2-3

**new method of process heating and cooling**

**\*saves 50%**

- \* in initial cost
- \* in heating and cooling time
- \* in tank space
- \* in maintenance labor

Each member of your buying committee should have this book which tells how Platecoils satisfactorily solve tank heating and cooling problems . . . and at the same time save time, money and manpower.

**PLATECOIL REPLACES PIPE COILS**

Write for your free copy  
of Bulletin P54 today!

TRANTRER MANUFACTURING, Inc., LANSING 4, MICHIGAN

When inquiring check CP 7797 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Air jet continuously cleans fabric dust collector . . .**

forced in opposite direction to flow

**Uses:** Collector is specially designed for applications where extremely fine particles are involved and where material must be collected in dry state for reclaiming.

**Features:** Cleaning medium is automatically reconditioned by a jet of high pressure air forced through the cloth in opposite direction to flow of air being cleaned. Due to continuous cleaning cycle, collector maintains constant pressure drop and steady air volume at exhaust points, and permits higher velocities through tubes.

**Description:** Operating principle is as follows: dust-laden air enters collector through inlet plenum and passes into cloth tubes suspended between plenum and hopper. Air is then forced through fabric media where dust particles are filtered out and clean air returned to work room or discharged outside. Removed particles cling to inner surface of tubes, trapped by exhaust pressure until dislodged by jet ring assembly.

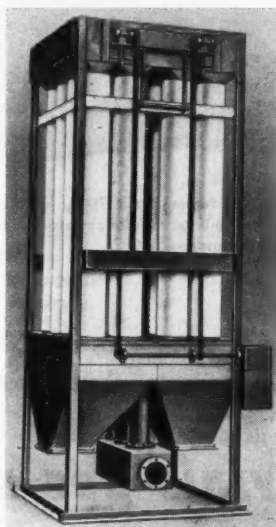
Jet rings contain annular orifice surrounding entire periphery of each tube. As assembly moves up and down cleaning section, high velocity air jet passing through orifices is forced through media in reverse direction to flow of exhaust air.

Individual floating tension weights are used to connect each tube with dust storage hopper. Hollow weights are inserted into hopper through flexible rubber seal. Weights maintain tension on tubes and keep the diameters uniform, despite different temperature and humidity conditions.

Collector comes in two basic models. One is weather-proof, housed unit, where cleaned air is discharged outside or to process. In this model the fan must be located on clean air side. A less expensive model is for use where fan is installed on air entering side, and cleaned air returned to adjacent space.

Unit can be furnished for unlimited capacities by merely combining sections. Media tubes come in 6, 9, 12, and 15-ft lengths. Filter fabrics available are cotton sateen, wool, orlon, and other synthetics.

(Amerjet dust collector is product of American Air Filter Company, Inc., Dept. CP, 215 Central Ave., Louisville 8, Ky. . . or for more information check CP 7798 on handy form, pages 2 and 3.)



Reverse jet fabric dust collector has continuous cleaning cycle

# The NEW Richardson VELOFEEDER

**means  
Better Bulk Feeding  
for the  
Chemical Process  
Industries**

## HERE'S WHY—

**Higher Output**—from 300 to 50,000 lb. per hr. of hard granular materials, or 300 to 30,000 lb. per hour of soft ground materials.

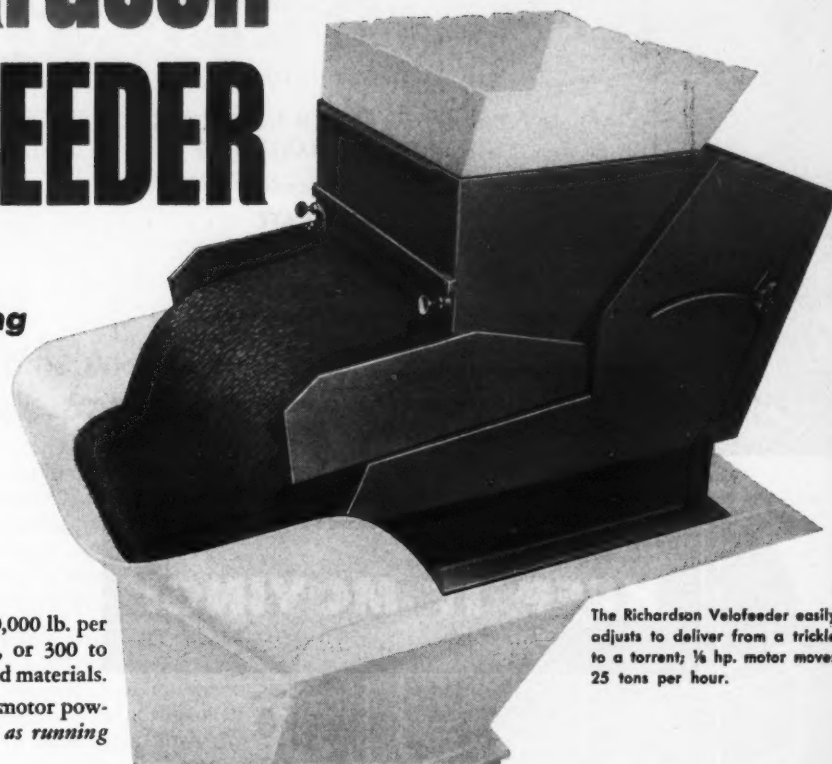
**Lower Power Needs**—a 1/8 hp. motor powers entire unit—as *inexpensive as running a 100-watt light bulb!*

**Smaller Space Needs**—only 35 inches long, 17 1/2 inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

**Easier Control**—simple, quick adjustment, over wide operating range (from near 0 to 50 fpm. maximum).

**Safer Operation**—motor is explosion-proof (Class 2, Group G) where hazardous dust conditions exist. Complete dust enclosure on special application.

**Less Vibration**—although working frequency is 1850 vibrations per minute, little or no vibration is transmitted to any mounting installation (mounts with only 4 bolts!).



The Richardson Velofeeder easily adjusts to deliver from a trickle to a torrent; 1/8 hp. motor moves 25 tons per hour.

Now widely introduced for the first time, the new Richardson Velofeeder is a vibrating feeder offering *all* the advantages outlined. It is mechanical in operation, requiring negligible power to deliver a very high output rate, unequalled for total efficiency. Of more than 300 now in use, none has failed. Ideally suited to the feeding of free-flowing chemicals, fertilizer, rubber pellets, and similar materials, the Velofeeder offers a wide range of profitable application. Immediate delivery. For complete information on this new development, please write for Data Sheet 5302.

# Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

**RICHARDSON SCALE COMPANY**  
Clifton, New Jersey

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When inquiring check CP 7799 on handy form, pgs. 2-3



BLACK DIAMOND  
VALVE BAG

## packer & settler

FOR A **BETTER** PACKAGE...

investigate this new,  
sensational combination  
of automatic controlled  
weight valve bag  
packer and settler.

**EASIER HANDLING  
& PALLETIZING  
CLEAN—NO DRIBBLE  
ACCURATE  
ECONOMICAL  
PERFORMANCE  
GUARANTEED**

Packer and  
Settler may be  
purchased as  
separate units

For further information, write  
**BLACK PRODUCTS COMPANY**  
13513 Calumet Ave., Chicago 27, Illinois • Dept. P33  
MANUFACTURERS SINCE 1912

When inquiring check CP 7800 on handy form, pgs. 2-3

## KEEP IT MOVING!

Granular  
or wet materials  
noiselessly

Whatever your particular problem may be—if you want to move materials by effective vibration, there is a Peterson Vibrolator to fit your needs perfectly. Spark-proof, all-directional vibration for bins; chutes, or hoppers. Require no maintenance or lubrication. Guaranteed instant self-starting every time. A variety of sizes and models including one which operates at ambient temperatures up to 1000°. Write for literature and complete specifications.

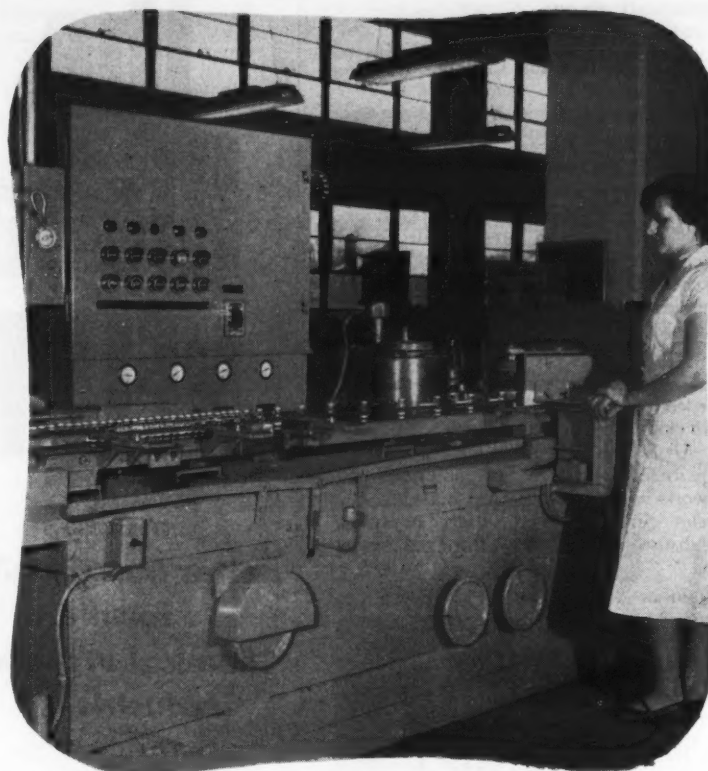
**MARTIN**

**ENGINEERING COMPANY**

KEWANEE 3, ILLINOIS

When inquiring check CP 7801 on handy form, pgs. 2-3

## packaging



Thermoplastic labeler, which has a production rate 750% greater than former unit, shown above in operation on 5 cc vials of streptomycin at the Bristol Laboratories

While former rate was 40 per minute, thermoplastic unit—

**labels 300 vials per minute  
without glue**

**Neater labels provided by automatic unit which is easy to operate, adjustable for different sizes**

**Problem:** At Bristol Laboratories in Syracuse, N. Y., labeler used for pharmaceutical vials failed to meet requirements for expanding production. Unit could handle only about 40 bottles per minute. Operator had to pick up each vial and insert it in machine, where it was labeled and placed on conveyor.

Former unit also used glue for labeling, which had to be prepared and adjusted for proper consistency. In addition, use of glue was not as neat a procedure as was desired.

**Solution:** Three years ago, company acquired automatic thermoplastic labeler shown in accompanying photograph. One year later a second unit of the same type was obtained. Latter machine will handle flat bottles as well as round and is of a slightly different design.

These machines operate by the so-called

"dry" labels are transferred. Transfer allows it. Bottles are spaced and coated when it pressure operation. Since wa not requ is elimin addition tainers. 20 cc via and from machine. Results: Bristol o per min former results in adjusted operate. Very litt labelers (Label-D Jersey M Ave., H check CP

**Improve permits operation**

Push-but with aut that con any time down pr automati Model P container claims t output, p fatigue. (Filling Corp., D N. Y. on hand

You light

"dry" labeling procedure. No glue is used. Labels are printed on thermoplastic-coated paper. Transfer cylinder selects each label by suction and allows it to be fed against heated delivery drum. Bottles are spaced by feed screw in relation to spacing of labels on drum. Heat softens plastic coating on label so that it adheres firmly to vial when it is forced against it by air pressure. Flat pressure pad which presses against label completes operation.

Since water usually used for thinning of glue is not required, distortion of labels from this source is eliminated. Variable speed labeler needs no additional parts for changing to different size containers. Units used at Bristol handle 5, 15, and 20 cc vials. However, labels from 1 1/4 to 5" wide and from 1/2 to 6" high can be applied with the machine.

**Results:** Each of the two labelers in use at Bristol operates at an average speed of 300 vials per minute, a 750% increase for each unit over former method. Elimination of messy glue pot results in neater labels. Machines can be quickly adjusted for different vial sizes and are easy to operate. One operator is used for each unit. Very little maintenance has been required on the labelers since they were placed in operation.

(Label-Dri Champion labeler is product of New Jersey Machine Corp., Dept. CP, 1553 Willow Ave., Hoboken, N. J. . . . or for more information check CP 7802 on handy form, pages 2 and 3.)

**Improved filling machine design permits conversion to manual operation when necessary**

Push-button controlled, pneumatic vacuum filler, with automatic filling cycle, has been improved so that conversion to manual operation may be made any time. This design change was made to cut down production time loss should any part of the automatic equipment fail.

Model PVN, available in six to 14 spouts, handles containers up to one gallon, and manufacturer claims that push-button control increases labor output, production efficiency, and reduces operator fatigue.

(Filling machine is a product of Packer Machinery Corp., Dept. CP, 30 Irving Place, New York 3, N. Y. . . . or for more information check CP 7803 on handy form, pages 2 and 3.)

You can find enthalpies of mixtures of light hydrocarbons with nomograph on page 188

"what a *difference*  
**AVERY**  
*Kum Kleen*  
**LABELS** *make...*  
they're pressure-sensitive!

*...and save us time and money  
—in every department!"*

■ On the production line or on the product... in the shipping department, warehouse or office...engineering, inspection or research...in maintenance or management...every place you need to mark or label, Avery can save you time and money—can simplify and speed your work.

■ Avery Pressure-Sensitive Labeling is different because there's no licking or moistening...no sticky or messy fingers...and no waste motion. They're self-adhesive...on at the touch of a finger—and they're tight, right now!

■ Avery Dispensers—either manual or electric—are available to give you low cost, dependable labeling. They're inexpensive to own and operate...need no special or skilled labor. They'll work into any production line—at any desired speed.

■ Write today for details, free samples and case histories of *Avery Pressure-Sensitive Labeling!*

**AVERY**  
*Kum Kleen*  
**LABELS**

**SPECIFICALLY SPEAKING...**



**color coding**

Instant identification of the contents, quality or quantity of a package or case saves valuable time and prevents costly errors.



That's why hundreds of various manufacturers, stores and business firms—everything from a bakery in San Antonio to a thread mill in New England—use Avery Kum-Kleen Labels for quick visual coding.

Four different variables can give almost any amount of data needed: color, size, shape and printed letter or number codes are made to your order or specifications. Where can you save time and money with Avery Color Code Labels?

**AVERY ADHESIVE LABEL CORP., Custom Div. 123**  
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☐ Please send case histories and free samples ☐ Have the Avery Label man call

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
Our Business Is \_\_\_\_\_

When inquiring check CP 7804 on handy form, pgs. 2-3





## We like TOUGH package problems

FOR EXAMPLE, one of our customers who realized the advertising possibilities of his shipping sacks, suggested a design in colors so brilliant as to seem, offhand, impossible of reproduction on tough kraft stock.

But we experimented with various inks and methods of application and came through with just what the customer wanted.

Could we ship on short notice? We could. *And did.*

Are *your* shipping sacks providing full value from the standpoint of impressive advertising? Call in the Raymond man for constructive suggestions. No obligation.

THE RAYMOND BAG COMPANY  
Middletown, Ohio. Phone 2-5461

**Raymond**  
**MULTIWALL PAPER**  
**SHIPPING SACKS**

When inquiring check CP 7805 on handy form, pgs. 2-3

### PACKAGING

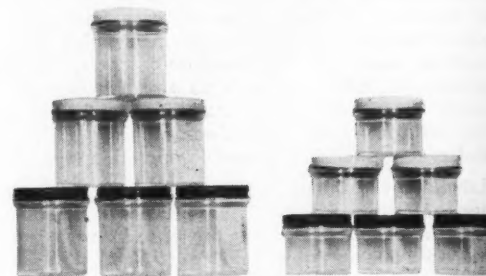
#### Improved product appearance provided by transparent plastic containers . . .

polystyrene jars are shatterproof, lightweight, non-toxic, odorless, and tasteless

**Uses:** For packaging of pharmaceuticals, small parts, bolts and nuts, and a wide variety of other industrial products.

**Features:** Packaging of products in these transparent containers is said to make them look their best at all times. Material is shatterproof, lightweight, non-toxic, odorless, and tasteless.

**Description:** Polystyrene plastic containers shown in accompanying photograph are available in wide mouth design in either 2-oz or 4-oz size, with black, white, or red metal caps. Material has generally good resistance to weak acid and alkalis,



Polystyrene containers available in 2- or 4-oz sizes

but is not resistant to benzene and ketones. It has fairly good impact resistance and excellent clarity.

(Employees polystyrene containers are product of Celluplastic Corp., Dept. CP, 50 Avenue L, Newark 5, N. J. . . . or for more information check CP 7806 on handy form, pages 2 and 3.)

#### Variety of applications possible with 3 types of fiber drums

Individual requirements demanding specialized qualities often make containers suited for one job inadequate for another. Different construction features, capacities, and top designs of 3 types of fiber drums are described in separate 4-page bulletins. Capacities range from  $\frac{3}{4}$  to 75 gal and packing weight limits range from 60 to 400 lb.

Bul Fiberpak, Stapak, and Leverpak are issued by Fibre Drum Div., Continental Can Co., Dept. CP, Van Wert, Ohio. When inquiring specify CP 7807 on handy form, pages 2 and 3.

For more information on product advertised at right, specify CP 7808 . . . see information request blank between pages 2 and 3.



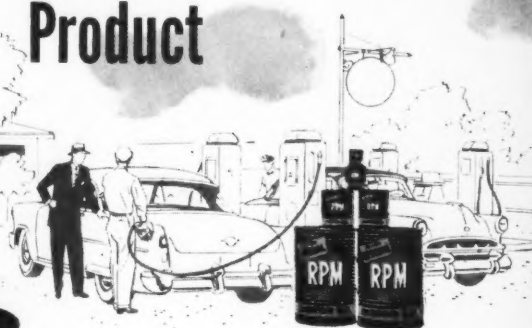
# Rheemcote Poster Drums

Give Sales Producing "Family Identification"

to *new*

CALIFORNIA OIL COMPANY

Product



To introduce its *new* RPM 10-30 Special Motor Oil, The California Oil Company supplemented usual types of advertising with a colorful display designed to help win quick public recognition and acceptance for this new product.

An attractive, new four-color package design was developed. This design is featured on all RPM 10-30 packages from one-quart cans to 55-gallon drums.

This "family" of packages displayed in pyramid form at thousands of service stations throughout the East has helped California Oil quickly establish recognition and acceptance for this new motor oil.

Reproduction on large containers of the same design that appears on small packages is made possible by the exclusive Rheemcote lithograph process with which any design can be reproduced on drums up to 55-gallons in capacity.

You can use this powerful new advertising medium effectively. We will be glad to discuss the matter with you, or send you a colorful booklet which describes the sales possibilities of this important new medium.

*Sell as you  
ship with*

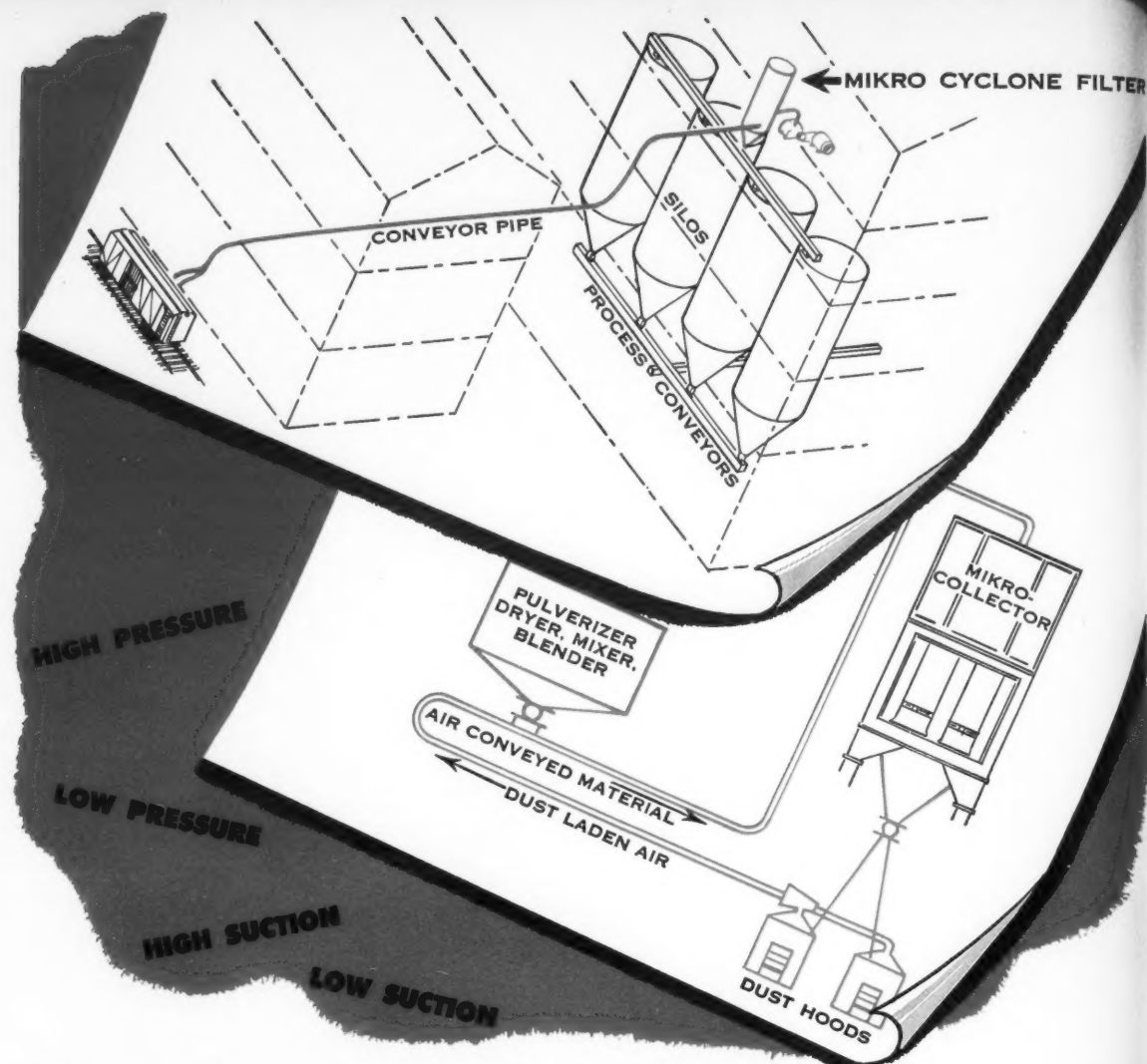
**Rheemcote Drums**

**RHEEM MANUFACTURING COMPANY**

**World's Largest Manufacturer of Steel Shipping Containers**

RICHMOND, CALIFORNIA • SOUTH GATE, CALIFORNIA • HOUSTON, TEXAS • CHICAGO, ILLINOIS  
 NEW YORK, NEW YORK • NEW ORLEANS, LOUISIANA • LINDEN, NEW JERSEY • SPARROWS POINT, MARYLAND





## What is Your conveying problem?

### MIKRO is the answer!

The MIKRO line of pneumatic conveying equipment offers the answer to a wide range of materials handling problems.

Built in low or high pressure types—from lowest suction for short runs, using as little as 12 inches of water—up to high suction jobs employing 10 psia, transferring materials between steps in processing operations, or conveying large bulks of materials from processing to storage, or from cars to storage, etc.

The MIKRO-AIR CONVEYING SYSTEM provides an ideal, modern method of conveying materials from any source. Completely flexible, it solves and greatly simplifies plant layout problems. Dust-tight, it assures freedom from infestation and contamination, and is easily cleaned. Handling of radio-active dusts is accomplished with perfect safety. Separate cyclone is eliminated.

Collection equipment used is also adaptable for central vacuum cleaning operations.

System can be used in layouts integrating dryers, mixers, blenders, MIKRO-PULVERIZERS, MIKRO-ATOMIZERS and MIKRO-COLLECTORS, storage packaging equipment and for incidental air clarification. The MIKRO-AIR CONVEYING SYSTEM is easier and more economical to install, operate and maintain.

Write now for information.

**PULVERIZING MACHINERY COMPANY**  
60 CHATHAM ROAD • SUMMIT, NEW JERSEY



## MIKRO - AIR CONVEYING SYSTEM

ALSO MAKERS OF  
MIKRO-PULVERIZERS • ATOMIZERS • COLLECTORS

SUBSIDIARY OF METALS DISINTEGRATING COMPANY, INC.

When inquiring check CP 7809 on handy form, pgs. 2-3



FOR low  
...strong  
...ability to  
in a hurry,  
Special Ba  
up under h  
provide th  
competitiv  
In the Un



When inquiring



RESISTS  
DIRT  
GREASE  
WATER  
ACIDS

LABELON  
surface-  
stylus o  
grease,  
writing  
in rolls

Use Labelon  
Tape to mark  
vessels, test  
mens . . . to  
panel boards  
struments . .  
room shelves  
mark objects  
office files, fo  
ords, etc.  
For samples  
your nearest  
Dept. CP-4.

When inquiring

APRIL, 1



Left—  
Union Special  
Style 20100 H  
Bag Closing  
Machine

## Here's how to close MULTIWALL PAPER BAGS

**F**OR lower production costs...stronger, neater closures...ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your particular requirements. **ASK FOR RECOMMENDATIONS.**

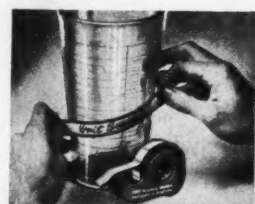
**SEND FOR THIS BULLETIN!**



Get your copy of this 16 page illustrated bulletin containing helpful data and charts on the complete Union Special line of bag closing machines. **UNION SPECIAL MACHINE CO., 442 North Franklin Street, Chicago 10, Illinois**

## UNION SPECIAL

When inquiring check CP 7810 on handy form, pgs 2-3



*Won't Smudge!*

**LABELON  
PLASTIC**

**RESISTS:  
DIRT  
GREASE  
WATER  
ACIDS**

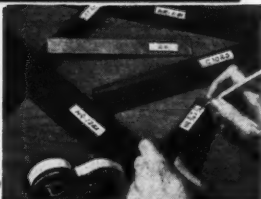
*Write on it*  
**TAPE**

**STICKS WITHOUT MOISTENING**

LABELON TAPE sticks without moistening to any smooth, dry surface—yet strips off cleanly. Write or print on it with pencil, stylus or typewriter. Message **WON'T SMUDGE**... defies dirt, grease, water, acids... stays clean, easy-to-read—because writing surface is protected by transparent plastic! Available in rolls—or in flat form on backing sheets for typewriter use.

Use Labelon "Write on It" Tape to mark test tubes, glass vessels, test batches, specimens... to identify circuits, panel boards, fuel lines, instruments... to label stock-room shelves, bins, hard-to-mark objects. Ideal, too, for office files, folders, stored records, etc.

For samples and prices, see your nearest dealer or write Dept. CP-4.



**LABELON TAPE CO., INC.**  
450 Atlantic Ave., Rochester 9, N. Y.

When inquiring check CP 7811 on handy form, pgs. 2-3

APRIL, 1954

## PACKAGING

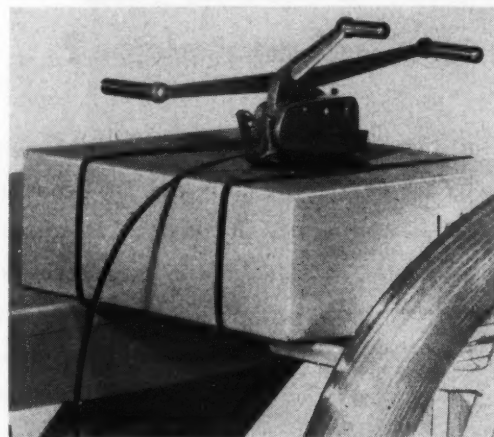
### Elimination of seals in strapping results in simplicity, saving in application...

bond effected is between 77 and 86% of strength of strapping itself

**Uses:** For external strapping of wood boxes or fiberboard cartons.

**Features:** Economy of strapping method results from elimination of seals of any kind, and time and cost of applying seals. Strength and resilience of strapping, locked under tension, is said to help container absorb shocks due to dropping or exceptionally rough treatment. In many cases it is reported that strapping method has permitted use of lighter packing materials.

**Description:** Advantage of method lies in machine used. In two operations machine tensions the strapping, cuts it to exact length void of waste, and effects a mechanical interlocking of two overlapping ends of strapping. It is said that strapping has consistently tested between 77 and 86% of strength of strapping itself.



Two operations of machine complete strapping

Coil holders and strapping table dispensers are available to dispense strapping in easy feeding loops. In floor or stand models they will accommodate standard 100 lb coils.

(Seal-Less Strapping method is a development of Inland Wire Products Co., Dept. CP, 3947 South Lowe Ave., Chicago 9, Ill. . . . or for more information check CP 7812 on handy form, pages two and three.)

### For a guide to packaging ideas...

You'll find what you need in the handy Product Directory on pages 213 to 216. All products and processes are listed there.

## CUT COSTS

Pack Chemicals  
in **VALVE BAGS**  
with

## AUGER-MATIC

Fills and Weighs... All in One Operation



NO DUST



NO WEIGHING



NO SEWING...  
NO TIEING

Cut production costs by packing your product in modern self-closing bags... the **AUGER-MATIC Bag Packer** fills them quickly to any weight desired... shuts off automatically.

Valve Bags fit snugly on **AUGER-MATIC** spout so no dust escapes... keeps bags clean... eliminates costly tying or bag closing equipment.

**AUGER-MATIC Bag Packer** is equipped with multi-twist auger... packs any materials from powder to pellets. Easily moved from one filling point to another.

Send for descriptive literature

**E. D. CODDINGTON MFG. CO.**

5036 North 37th Street • Milwaukee 9, Wisconsin

When inquiring check CP 7813 on handy form, pgs. 2-3



## How much *Tailor-made service* can we pack into a steel container?

We're fully aware that *your* packaging problems are not exactly the same as those of other steel container users. That is why we go out of our way to hand-tailor our deliveries, our lithography, engineering and other services to your specific requirements. We make available all the help you can use, anytime you say. Before you place another order for steel containers, why not listen to our story? We'd relish a chance to work with you—not just as suppliers, but as interested counselors and friends.



Standard styles include pails, drums, hand cans. Always glad to discuss special-purpose containers.

**TAILOR-MADE  
PACKAGE SERVICE**

## CONTINENTAL © CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17

Central Division: 135 So. La Salle St., Chicago 3

Pacific Division: Russ Building, San Francisco 4

When inquiring check CP 7814 on handy form, pgs. 2-3

## PACKAGING

**Valve bags automatically packed, contents weighed and settled by combination filler . . .**

agitator feed hopper prevents bridging and assures steady flow of material

**Uses:** For automatic filling, weighing, and settling material in multiwall valve bags.

**Features:** With Black Diamond automatic-controlled weight packer, valve bag is simply placed on filling tube and starter button is pressed. When predetermined weight is reached, downward pressure of filling tube operates a micro-switch which immediately stops flow of material.

Settler attachment assures that material is evenly and thoroughly filled, improving appearance and handling qualities of bag. Feed hopper with agitator is an integral part of packer and prevents bridging or interruption of steady flow of material to feed screw.



Settler improves appearance and handling of multi-wall valve bags

**Description:** Packer was primarily designed to fill 50 and 100-lb bags, but density of many materials permits packing to 25-lb weights. Unit is electrically operated by means of totally enclosed motor. Dust-tight electrical fittings are used throughout. Packer can be made explosion proof if it must be used in dangerous atmospheres.

Dust control housing surrounds filling tube which can be vented outside or connected to established dust collecting system. Unit is readily movable, shipping weight being approximately 800 lb. Overall dimensions are 54" height, 24" width, and 49½" length.

(Combination valve bag packer and settler is a product of Black Products Co., Dept. CP, 13513 Calumet Ave., Chicago 27, Ill. . . . or for more information concerning manufacturer's product, reader may simply check CP 7815 on convenient Reader Service slip which is located between pages two and three.)

**Feeds,  
pressure  
tape . . .**

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**Uses:**  
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**Features:**  
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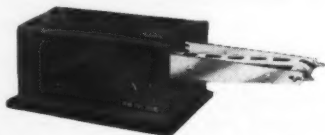
## PACKAGING

### **Feeds, cuts, dispenses pressure-sensitive tape . . .**

electrically operated machine  
is fully automatic

**Uses:** For automatic dispensing of pressure-sensitive tape.

**Features:** Electrically operated dispenser automatically feeds, cuts and dispenses pre-determined lengths of any pressure-sensitive tape. Operator always has both hands free for taping job being performed. Unit is easy to use and is said to cut all waste motion, thus saving on taping costs.



Automatic dispensing leaves operator's hands free

**Description:** Machine is set to dispense tape for length required and speed of dispensing. Speed can be as high as 3" of tape per sec, or most any intermediate speed chosen.

Standard machine dispenses  $\frac{1}{2}$  to 3" wide tape and in lengths from  $\frac{7}{8}$  to 18". Shorter or longer lengths are possible by the use of special machine.

Pre-cut lengths of tape are conveyed to one or more operators by use of a 15" moving conveyor built on machine. Operators can remove tape from conveyor at any point. A slitting attachment can easily be made an integral part of dispenser.

Overall length of machine, called the Automatic, including 15" conveyor is 35". Width and height are both 12". Weight is approximately 35 lb. Unit operates on 110 v AC, 60 c, single phase.

(Tape dispenser is a product of Penn Tape Savers, Dept. CP, D and Luzerne, Philadelphia 24, Pa. . . . or for more information check CP 7816 pages 2 & 3.)

For more information on product at right, specify GP 7817 . . . see information request blank between pages 2 - 3.

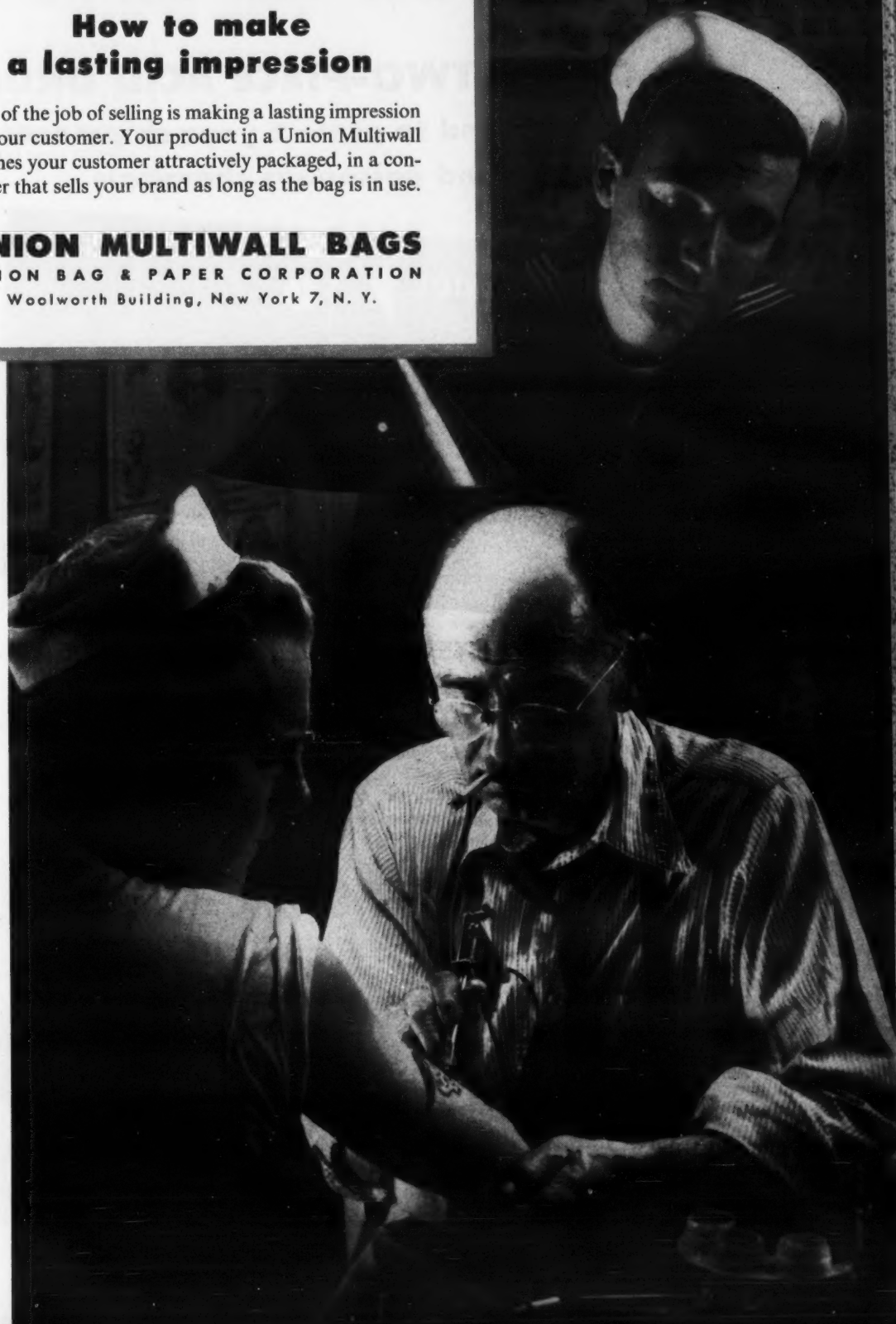
## **How to make a lasting impression**

Part of the job of selling is making a lasting impression on your customer. Your product in a Union Multiwall reaches your customer attractively packaged, in a container that sells your brand as long as the bag is in use.

### **UNION MULTIWALL BAGS**

UNION BAG & PAPER CORPORATION

Woolworth Building, New York 7, N. Y.





*inside and  
outside*

## HACKNEY TWO-PIECE ACID DRUMS

**...are designed to protect your shipments  
of corrosive and poisonous chemicals**



**INSIDE**

- 1 Smoother interiors are exceptionally easy to clean—are free from cracks and crevices.
- 2 This extra-smooth butt weld joins the two entirely seamless halves of the drum.
- 3 Here is the seamless formed chime used on the 15-, 20- and 30-gallon sizes.
- 4 Here is the seamless, reinforced chime construction for the larger 55- and 110-gallon sizes.

**OUTSIDE**

- 5 Sturdy I-Bar rolling hoops—protect the seam and spud against hard knocks.
- 6 Heavy, forged spud is firmly welded—becomes an integral part of the drum itself.
- 7 Two-piece construction eliminates head and longitudinal seams (no crevice corrosion), increases strength and shock resistance.
- 8 Heavy, curled foot ring reinforces chime on the larger sizes—withstands transportation abuse.

Fully described in the new Hackney Drum and Barrel Catalog. Send for your copy today.

### Pressed Steel Tank Company

Manufacturer  
of Hackney Products



1463 S. 66th St., Milwaukee 14 • 52 Vanderbilt Ave., Room 2087, New York 17 • 235 Hanna Bldg., Cleveland 15 • 936 W. Peachtree St., N.W., Room 126, Atlanta 3 • 208 S. LaSalle St., Room 796, Chicago 4 • 568 Roosevelt Bldg., Los Angeles 17 • 18 W. 43rd St., Room 19, Kansas City 11, Mo. • Dept. CPP—Dowington, Pa.

CONTAINERS FOR GASES, LIQUIDS, AND SOLIDS

When inquiring check CP 7818 on handy form, pgs. 2-3

### PACKAGING

**One pull of wire tie twister  
and bags are fastened  
securely . . .**

experienced operator can tie up to 400 bags/hr

**Uses:** To aid in tying paper, cloth, and plastic shipping bags with wire.

**Features:** Wire tie twister is so designed that one short pull closes wire tight. Method is said to be faster than tying with string or sewing. No skilled labor is needed, but one experienced operator can do as many as 400 bags/hr. Ties won't slip or loosen, but can be easily opened without damaging bag, permitting it to be re-used. Ties that have been tampered with are easily detected.



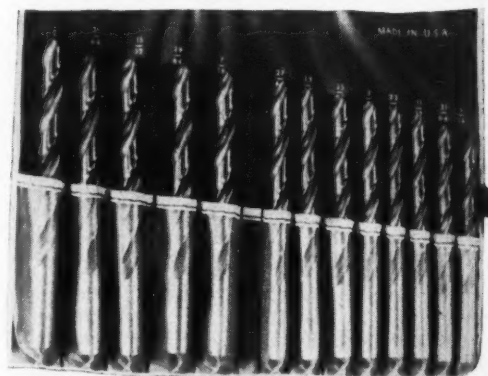
Makes wire ties that won't slip or loosen

**Description:** Rapidfire wire tie twister, Model 60E, is of all steel construction, chrome plated for appearance and rust-proofing. Metal loop for attaching tool to operator's belt helps prevent loss. Ratchet and spring return allows wire tie to be continually twisted and hook to return automatically to starting position without removal from tie. Tool has an extra large wooden handle for better grip.

(Wire tie twister is a product of Montgomery & Co., Inc., Dept. CP, 7 Tichenor Lane, Newark 5, N.J. . . . or for more information check CP 7819 on handy form, pages 2 and 3.)

**Drills packaged in plastic  
are easily put in place**

Manufacturer has announced packaging of sets of high-speed steel twist drills in plastic bags. These bags have individual pockets for each drill, which are marked with size of drill in that pocket. Advantage is that mark on bag is legible long after size has been obliterated from shank by drill press chuck, and no matter how badly shank is scored, drill can still be inserted in proper pocket of bag.



Bag is furnished with drill set

Bags replace envelopes in which drills normally are packaged. Since cost of envelopes is omitted, bag is furnished free with drill set.

Four sets are available in jobber length drills: No. 10, 1/16 through 1/4"; No. 13, 1/16 to 1/4" by 64ths; No. 15, 1/16 to 1/2" by 32nds; and No. 29, 1/16 to 1/2" by 64ths. Same sets are available in machinist length drills.

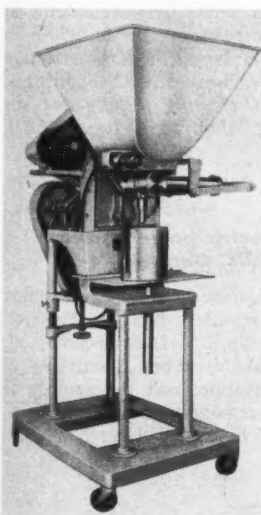
(Drills packaged in plastic are a product of Hayden Twist Drill Co., Dept. CP, 8626 Lyndon Ave., Detroit 38, Mich. . . . or for more information check CP 7820 on handy form which is located between pages 2 and 3.)

**If automatic filler is not justified,  
semi-automatic unit useful  
with variety of products**

**Uses:** For filling food, cosmetic, chemical, paint, and similar semi-liquid and semi-solid products into all types of containers including tubes. Unit is said to be ideal for use in small or large plants where expense of a fully automatic filling machine would not be justified.

**Features:** Versatile, mobile unit accurately fills between 15 and 55 containers per min, depending on product and size of container to be filled. It also can be easily cleaned, quickly changed over to different products and containers.

**Description:** All contact parts on filler are of stainless steel and monel, making machine sanitary for all operations.



Fills between 15 and 55  
containers per min

Variable speed drive permits wide speed range, and a separate motor-driven agitator can be supplied for use with products that must be constantly mixed and forced into measuring cylinder. Whenever required, a foot-operated clutch can be provided to free operator's hands for filling operations.

Machine contains a 25 gal stainless steel hopper, is said to be simple and easy to operate, and is ruggedly constructed.

(Filling machine is a product of The Filler Machine Co.,

Inc., Dept. CP, Philmont Club Station, Pa. . . . or for more information concerning manufacturer's product, reader may simply check CP 7821 on handy Reader Service slip located between pages two and three.)

# "C"-man...

## RELY ON THE

The famous "Cutty Sark" built in 1869 set a record of 363 miles in one day. Twenty-two years before this clipper sailed the China seas, the Chase Bag Company set out on a never-ending journey—a continuous search for better packaging products.



Backed by 107 years of packaging experience

It costs you nothing, yet it's apparent in every Chase Bag...over a century of experience. The know-how is reflected in the sound recommendation of every "C" man, your capable Chase representative.

Oldest of all bag companies, Chase guards its reputation jealously. Today, every packaging

product that carries this respected name is the result of a 107 year search for perfection...the best materials, the finest workmanship, the fairest prices, the best service.

You cannot put your packaging problems in more capable hands. You cannot put your product in better bags.

over  
a century  
of know-how is  
behind  
every CHASE  
MULTIWALL  
BAG



## Low Cost Protection For Your Product

The modern low-cost way to protect your product is to package it in Chase MULTIWALL Bags. It's the economical package with all these features:

- Fine appearance
- Clean, colorful printing
- Dependable product protection
- More sales appeal
- Easy to stack and store
- Wide selection of sizes, types

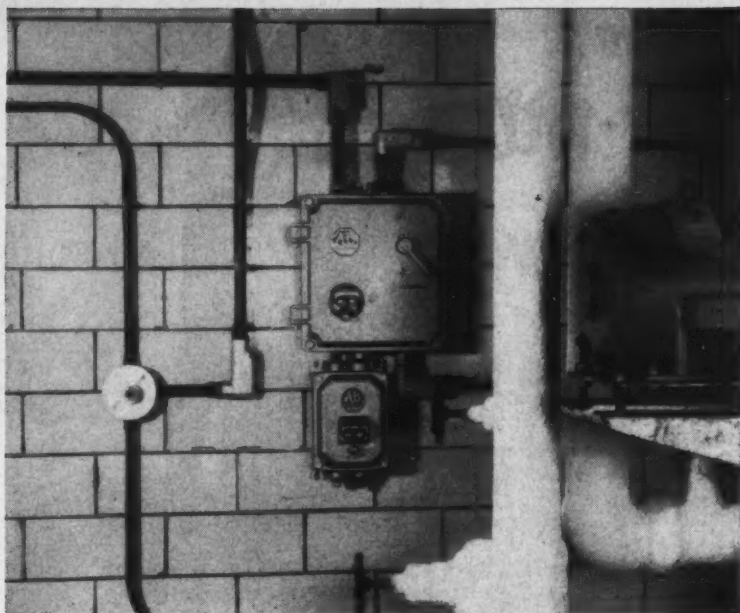
Available from 2 to 6 plies—Sewn Valve, Sewn Open Mouth, Pasted Valve, Pasted Open Mouth.

Place your next order with Chase

**CHASE BAG COMPANY** General Sales Offices: 309 W. Jackson Blvd., Chicago 6, Ill.  
30 BRANCHES AND SALES OFFICES—STRATEGICALLY LOCATED

When inquiring check CP 7822 on handy form, pgs. 2-3





## CORROSION-FREE electrical raceway

It's Republic ELECTRUNIT "Dekorin-Coated" E.M.T., the raceway that resists the action of fumes, gases, steam and other corrosive materials. And you can see that it's doing a job in this meat-packing plant.

Republic "Dekorin-Coated" E.M.T. gives you double protection. It has a polyethylene coating over the galvanized finish of ELECTRUNIT E.M.T., the steel raceway. It gives fume-free protection from outlet to outlet.

Installation is simple. There is no exposed metal, no threads to cut. You use the same compression-type fittings as you do on Republic E.M.T. Wrap them in either polyethylene or vinyl tape, and you have corrosion protection from end to end. For locations where threaded installations are required, there's "Dekorin-Coated" hot galvanized conduit.

Republic "Dekorin-Coated" E.M.T. reduces replacement costs. It cuts the down-time of costly equipment. It costs less because it lasts longer. Get all the facts by writing for Booklet DEK-1-54.

### REPUBLIC STEEL CORPORATION Steel and Tubes Division

205 East 131st Street, Cleveland 8, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO  
Export Department: Chrysler Building, New York 17, New York



When inquiring check CP 7823 on handy form, pgs. 2-3

# briefs

from contemporary publications

### Fuel oil: storage, handling, and heating

This paper presents suggestions as to storage of oil outdoors above ground in dyked tanks, underground storage in properly secured tanks, storage within the plant, location of tank farms to minimize the cost of pumping, and heating of oil at the point of suction by steam and electricity. Piping diagrams are included. Two pages, 5 figures. ("Power Engineering," October 1953, page 80)

### Analyses of titanium alloys

Seven papers cover colorimetric determination of silicon, aluminum and phosphorus, nephelometric and gravimetric determination of calcium, and polarographic and gravimetric determination of molybdenum in alloys of titanium. Apparatus, reagents, and procedures are presented in detail along with measures of precision. 17 pages, 17 tables, 5 figures. ("Analytical Chemistry," Oct. 1953, page 1432.)

### Gas analysis determines current efficiency

Current efficiencies of diaphragm alkali-chlorine cells are determined from the ratios of carbon dioxide and oxygen to chlorine, once a 24-hr cumulative sample is obtained. This stoichiometric method is less laborious than any requiring measurement of current input and total production. Fully explained with an illustrative example. Four pages, 1 figure. ("Journal of the Electrochemical Society," October 1953, page 448)

### Cooling towers: theory and practice

Equation and plots, with experimental origins, enable one to predict performance of cooling towers. Variables include air and water rates, wet bulb

temperatures, elevations above sea level, cooling ranges, and approaches to wet bulb temperatures. These methods aid in design, operation, and evaluation of cooling towers. Four pages, 5 figures. ("Heating, Piping and Air Conditioning," October 1953, page 109)

### Report on process piping

Without infringement on the coverage given in the handbooks, T. R. Olive presents detailed information on metallic and nonmetallic piping, valves and fittings. Codes, standards, and design are included. Twenty-three pages, 4 tables, 4 photographs, 10 references. ("Chemical Engineering," Dec. 1953, page 187)

### Superheated water

Use of water under pressures above 30 psig and temperatures up to 350°F in closed circuits favors high heat storage capacity and savings in fuel. Four pages, 6 figures. ("Heating, Piping and Air Conditioning," Jan. 1954, page 156.)

### New hydroelectric power station at Niagara Falls, Ontario

Maps, profiles, and photographs reflect the Sir Adam Beck-Niagara Generating Station No. 2. Data include cost, capacity, exact location, description of tunnels, excavation, and the geology of the area. Five pages, 2 figures, 4 photos. ("Consulting Engineer," Dec. '53, p 20.)

### Survey of analytical chemistry

Recent theoretical and fundamental developments in all phases of analytical chemistry are presented in twenty-five reviews. One hundred and eighty-two pages, 6442 references. ("Analytical Chemistry," Jan. 1954, page 1.)

### Aluminum for industrial piping

This paper deals factually with aluminum piping as used in the new Alcoa building in Pittsburgh and in other applications pertaining to the chemical, petrochemical, petroleum, and food processing industries. Tables give properties, compositions, and tensile strengths of aluminum pipe. Four pages, 3 tables, 4 photographs. ("Heating, Piping and Air Conditioning," Nov. 1953, page 116)

### Reduction of circulation losses in drilling oil wells

Vulgar limestone, unconsolidated formations, and fractures in rock are sealed with ground black walnut shells. The shells, suitably graded and in granular form, have no adverse effects of the flow properties, viscosities, rates of filtration, and the cutting-carrying capacities of fluids employed in drilling wells. Two pages, 1 figure, 1 table, 1 photo. ("World Oil," Jan. 1954, page 105.)

### How to keep maintenance work on schedule

Organization diagrams, record forms, lubrication charts, and other sheets aid in conducting routine service while providing for emergency repairs and future work loads. Four pages, 5 figures, 3 photographs. ("Mill and Factory," Feb. 1954, page 86.)

### Design of converters for contact process

The amount of vanadium catalyst required for oxidation of sulfur dioxide in a two-stage adiabatic converter is determined by a new method. An optimum temperature distribution favors economy in size of converter and in amount of catalyst. Six pages, 5 tables, 5 figures, 9 references. ("Chemical Engineering Progress," November, 1953, page 585)

### Determination of gases in metals by vacuum fusion

In accordance with a method developed at the Watertown Arsenal, metallic specimens are melted in graphite crucibles under vacuum. Oxygen and oxides pro-

duce carbon monoxide, nitrides and hydrides are decomposed, nitrogen and hydrogen are liberated, and the gases are analyzed. Five pages, 2 figures. ("Journal of Chemical Education," Dec. 1953, page 609.)

### Methods for heating and air conditioning laboratories

This 5-paper survey covers modern methods of heating, ventilating, and air conditioning laboratories in the fields of soap manufacture, public health, motor truck engineering, education, and radioactive materials. Special attention is given to equipment, materials of construction, and air supply. Twenty-four pages, 11 photographs. ("Heating and Ventilating," Nov. 1953, page 86)

### Testing erosion-resistant cements

Lining material for catalytic cracking units must withstand blistering, exhibit dimensional stability, be easy to apply and repair, and resist erosion. The Shell Laboratories in The Netherlands offer effective tests to evaluate three kinds of erosion. Mechanical properties of cements are included. 5 pages, 1 table, 4 figures. ("Petroleum Processing," Oct. 1953, page 1514.)

### Orifices and Venturi tubes to measure gas flow

For metering gases, orifices and Venturi tubes are compared as to service problems, field accuracy, horsepower, and cost of installation. Detailed sample calculations are given. Six pages, 1 table, 1 figure, 3 photos. ("Petroleum Processing," Jan. 1954, page 66.)

### Plating room waste waters

Sodium metabisulfite, sulfuric acid, and hydrated lime are satisfactory for treating chrome and other waste waters from the plating room. This paper shows how treatment minimizes dusting and odor and provides a material that is clean and easily stored. A piping layout for a treatment plant is included. 5 pages, 1 figure, 8 photographs. ("Metal Finishing," Oct. 1953, page 60.)

## If Synthetic Rubber will handle it...



## Lowest Cost Pumping Unit in its Field

### Precision Molded Synthetic Rubber Casing:

Ruggedly built, age-cured, fully stress relieved. Ideal for conveyance of chlorine bearing fluids such as water, hydrochloric and other acids—plus many alkalies, and organic and inorganic fluids compatible with synthetic rubber.

duPont Neoprene, Hypalon or Teflon. All parts interchangeable, size for size, with Eco All-Chem stainless steel pumps and standard bronze process pumps.

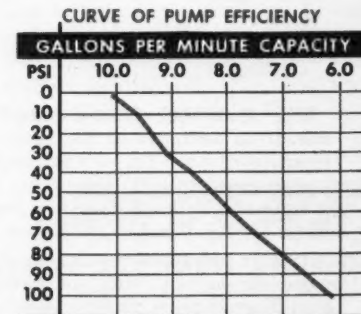
ECO ENGINEERING COMPANY  
12 New York Ave., Newark 1, N. J.

### Time Tried, Nationally Known Eco Pump Design:

Capacities up to 10 GPM and pressures to 100 PSI in sustained service at 1725 R.P.M. Unexcelled suction lift, safety self-priming design and linear flow.

### Internal Parts:

Shafts, etc., Type 316 stainless steel or Monel. Impellers of

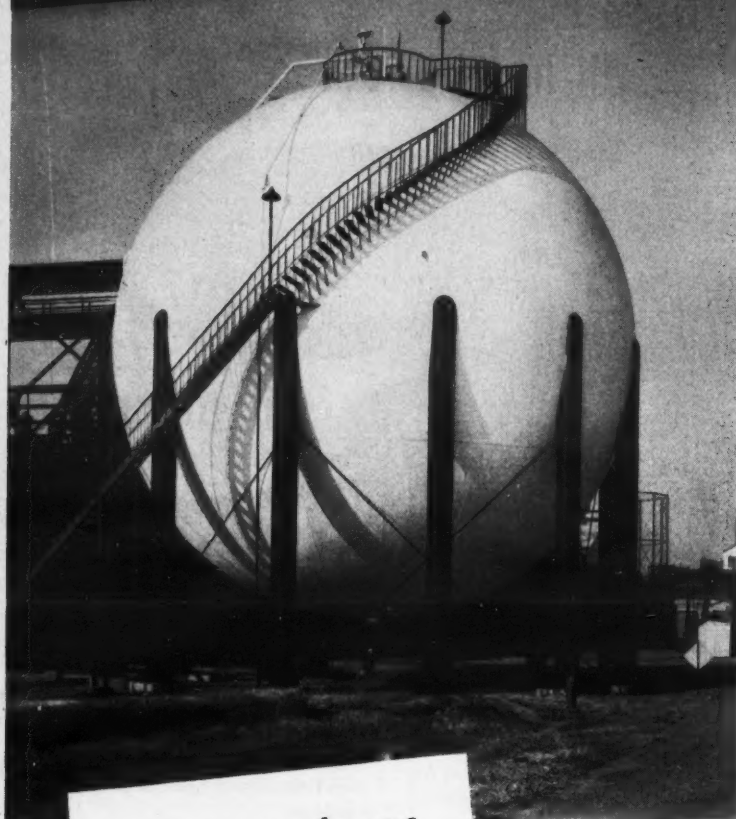


# ECO

When inquiring check CP 7824 on handy form, pgs. 2-3



# HORTONSPHERE



**for Anhydrous  
Ammonia Storage  
at Henderson**

The 15,000-bbl. Hortonsphere® shown above is used to store anhydrous ammonia at the Spencer Chemical Company's plant in Henderson, Ky. The welded steel structure is designed for working pressures up to 75 lbs. per sq. in. As ammonia develops internal pressures considerably greater than this at atmospheric temperatures, a recompression system was installed to reduce venting.

If your operations require the storage of volatile liquids or gases, write our nearest office for estimates or quotations on a welded steel Hortonsphere to help solve your problems. There is no obligation on your part.

## CHICAGO BRIDGE & IRON COMPANY

Atlanta 3 ..... 2107 Healey Bldg.  
Birmingham 1 ..... 1533 North Fifth St.  
Boston 10 ..... 1007—201 Devonshire St.  
Chicago 4 ..... 2116 McCormick Bldg.  
Cleveland 15 ..... 2212 Midland Bldg.  
Detroit 26 ..... 1535 Lafayette Bldg.  
Havana ..... 402 Abreu Bldg.  
Houston 2 ..... 2151 C & I Life Bldg.

Los Angeles 17 ..... 1536 General Petroleum Bldg.  
New York 6 ..... 3314—165 Broadway Bldg.  
Philadelphia 3 ..... 1650—1700 Walnut St., Bldg.  
Pittsburgh 19 ..... 3208 Alcoa Bldg.  
Salt Lake City 4 ..... 559 West 17th South St.  
San Francisco 4 ..... 1545—200 Bush St.  
Seattle 1 ..... 1307 Henry Bldg.  
Tulsa 3 ..... 1649 Hunt Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 7825 on handy form, pgs. 2-3

*engineering  
and maintenance*



Adhesive is applied to overlap area that paper flap will cover

## *labor savings result with wrap-around insulation*

**Cork covering is quickly and easily applied, reusable, and needs no wire or bands**

**Uses:** For application on air-conditioning systems and on chilled water and other cold lines where liquid temperatures in line are 30°F or above, and RH of surrounding air does not exceed 70%. On hot water cycle, covering will withstand temperatures up to 200°F.

**Features:** Installation costs of wrap-around cork covering are

Covering is positioned on pipe with flap downward to provide watershed



said to be sharply reduced, due to labor savings realized in application. Only sundry items needed for application — adhesive and strips of paper — are shipped with material.

Covering requires no wires, bands, or seam fillers to apply; no cloth, twine, or paper to wrap around; and no further indoor finish is necessary unless it is desired.

**Description:** LT-30 cork covering is fabricated from precision-cut segments of corkboard firmly adhered to a specially developed three-ply vapor-proof paper. Insulation is manufactured with a lap of LT-30 paper at a longitudinal joint. It is furnished in 36" lengths to fit all standard pipe and copper tubing sizes 1/4 to 12".

For installation, adhesive is applied to overlap the area it will cover. Covering is wrapped around pipe and held firmly in place and lap is pressed into position, effecting a vapor-tight seal. A strip of LT-30 paper is also pasted over end joints. This paper is a sturdy, flexible backing which provides positive resistance to vapor penetration in all applications.

Because no nails or staples are needed to hold covering in place during application, vapor barrier formed by LT-30 adhesive and paper is unbroken. When lines are relocated, paper can be cut and covering salvaged with no damage to cork. It can be resealed easily with a strip of paper and adhesive.

(Wrap-around cork insulation is a product of Armstrong Cork Co., Dept. CP, 1010 Concord St., Lancaster, Pa. . . or for more information concerning manufacturer's product, reader may simply check CP 7826 on the convenient Reader Service slip located between pages 2 and 3.)

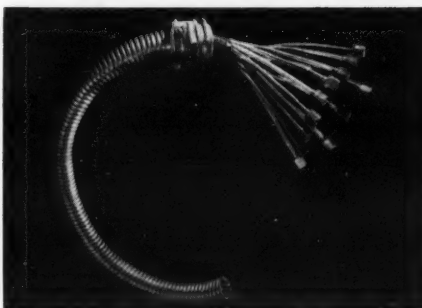
Vapor-proof paper is wrapped around joint to which adhesive is applied



## For the new pneumatic instrumentation

# Cabled Tube

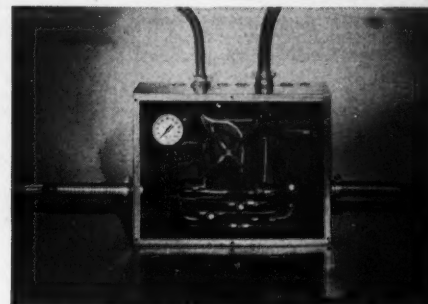
The recent tremendous increase in the use of tube instead of wires for instrumentation and control purposes has led to an important new development—cabled tube. This is an armored group of long tubes twisted together to permit bending without distortion. An insulating tape is wrapped over the bundle of tubes to prevent electrolytic action. Then interlocking, flexible galvanized steel armor is applied, like BX. This protects the tubes from injury during shipment, storage, installation, and in service. Standard fittings, boxes and cabinets can be used for junction boxes and terminations. To make it possible to readily identify each tube, one tube in each layer is colored; the position of each tube in each layer in relation to the coded tube



remains the same throughout the length of the cable.

The tubes usually are copper, but aluminum tubes can be used for special purposes. For unusually corrosive situations, a plastic outer sheath can be applied. As many as 19 tubes, 1/4" OD, can be cabled, and supplied in lengths up to 1,000 ft.

Since the tubes carry not electricity but air, nitrogen, helium, or a fluid, they are especially attractive in potentially explosive locations, as in refineries and chemical plants. Utilities are also turning decisively to this new cable, while automatic process control (automation) is a rising application.



Revere, as a supplier of tube for this purpose, calls this cabled tube development to your attention as a matter of general and perhaps specific interest. See Revere for copper, aluminum and brass tube and pipe, electric welded steel tube, and lockseam tube. Call the nearest Sales Office.

## REVERE

**COPPER AND BRASS INCORPORATED**

*Founded by Paul Revere in 1801*

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere  
SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

Showing the construction of Crescent Armored Multitube, made by Crescent Insulated Wire and Cable Co., Trenton 5, N. J., which will supply further information on request.

When inquiring check CP 7827 on handy form, pgs. 2-3



# Is Your Factory Starved for AIR?



If this is what happens when you go from the office out into the shop, your plant is starved for air! The vacuum created by the operation of necessary exhaust equipment is usually responsible. While our pictures may be slightly overdrawn, something like that may be happening in your plant.

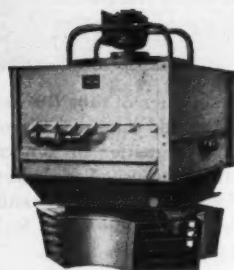
If your building is not new, the vacuum may be relieved by crevices, loose-fitting doors, windows, and open doors which will admit so much unheated air that a great deal of discomfort may be caused and your present heating system will be entirely inadequate.

If the building is tight—no excess crackage and no frequently opening doors—the ventilating system which you so painstakingly designed and installed to protect your employees and increase production won't work properly, unless you make special provisions for deliver-

ing into the building an amount of warmed air at least equivalent to that which your exhaust system will take out.

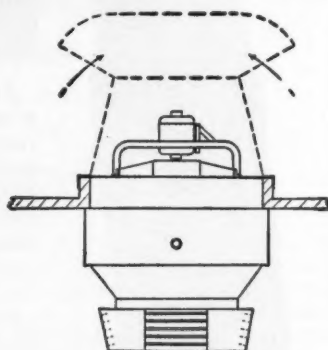
There is an easy solution. Install WING FRESH AIR SUPPLY HEATERS with Revolving Discharge Outlets. In winter they bring in fresh air through heating coils varied to just the right temperature, replacing exhausted air. In summer, with the steam turned off, they circulate the air in your plant, giving a cool, refreshing sensation to the workers and keeping production up to normal in stifling weather.

## WING FRESH AIR SUPPLY HEATERS



WING Fresh Air Supply Unit with fan enclosed in casing.

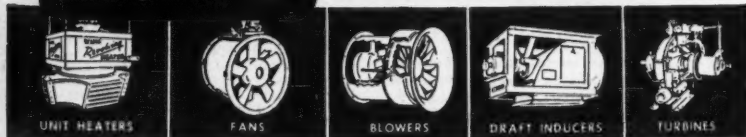
(Right) WING Fresh Air Supply Unit with fan above roof line.



# Wing

**L.J. Wing Mfg. Co. Linden, N.J.**  
179 Vreeland Mills Road

Factories: Linden, N.J. & Montreal, Canada  
In Europe: Etab. Wanson, Brussels, Belgium



When inquiring check CP 7828 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

### Describes fittings for use with light-wall pipe

Corrosion-resistant fittings for use with light-wall pipe are described in 20-page catalog. Fittings are readily adaptable to existing pipe lines and valves, pumps and plant equipment. Included in illustrated booklet are types of fittings with size ranges, dimensions, tolerances, test data, accessory equipment, charts, tables, methods, and general information.

Cat on corrosion-resistant fittings may be obtained from Horace T. Potts Co., Dept. CP, Erie Ave. and D St., Philadelphia, Pa. When inquiring specify CP 7829 on handy form, pages 2 and 3.

### Turbocharging gives 4-cycle engine 2000 hp and low fuel rate at full load . . .

compressor unit also features weight and size reductions, simple starting

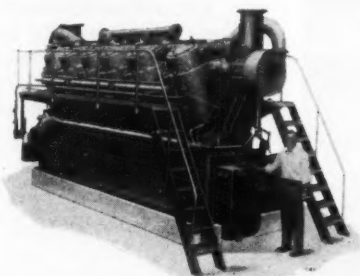
**Uses:** For application in gas transmission, petroleum, and chemical fields.

**Features:** By applying turbocharging, a 2000 hp four-cycle gas-engine-driven compressor has been made available, which is compact in size and economical in performance. Crankshaft design, with compound crankpins, also contributes to reduction in size and weight.

**Description:** Turbocharging, as applied to Type 412 KVS engine, is a combination of scavenging and supercharging by means of an exhaust-turbine-driven centrifugal blower. All power for scavenging and supercharging is obtained from normally wasted pressure and velocity energy of exhaust gases. Increase in back pressure is said to be negligible.

Unit is provided with two Elliott Type L-412 turbochargers, one at each end of engine, each driven by exhaust gases from adjacent six power cylinders. Both blowers discharge into a common air intake manifold.

Compression ratio of KVS engine is only 6.1, resulting in a compression pressure of 225 psi and a firing pressure of 600 psi at 2000 bhp. Rated BMEP is 121.6, giving turbocharged engine a conservative rating with ample capacity for normal overloads. Fuel rate of 7600 Btu/bhp/hr at full load is also low.



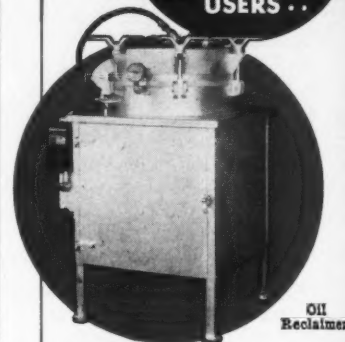
Compressor has rated BMEP of 121.6

## for Low VACUUM PUMP MAINTENANCE COSTS and BETTER VACUUM . . .

It's the

**HILCO OIL RECLAIMER**

VACUUM for PUMP USERS . .



A simple, economical and efficient method of restoring contaminated lubricating and sealing oil to the full value of NEW OIL. The HILCO will produce and maintain oil free of solids, gums, water and gases in a continuous, all-electric, automatic operation.

Be SURE of clean oil in your HIGH VACUUM PUMPS

**HILCO OIL RECLAIMER SYSTEMS . .**

• WRITE FOR COMPLETE DETAILS IN THE FREE BULLETIN

Recommendations at no Obligations

**THE HILLIARD CORPORATION**  
INDUSTRIAL DIVISION

58 W. Fourth St., Elmira, N. Y.

IN CANADA — UPTON - BRADEN - JAMES, Ltd.  
990 Bay St., Toronto, 3464 Park Ave., Montreal

When inquiring check CP 7830 on handy form, pgs. 2-3

CHEMICAL PROCESSING

According to turbochargers, high temperature water and for air conditioning and excessive

Unit has of the simplified access to

(Gas-engine) Ingersoll Rand, York 4, CP 7831

Trigger elimin wire str

wire doe

Uses: fixture v

Features: triggers, single sq

Description: holds jaw vents jaw particula

All parts which are and grow blade is in precise matching scoring

Blade ad stripper thickness

The "H" stripping parallel An adju

(Wire s Inc., De . . . or handy fo

On to ment

Your t Produ valves, Putma

APRIL,

According to manufacturer, other advantages of turbocharged engine are: low heat rejection and high temperature level with consequent savings in water and oil cooling equipment; elimination of need for air cooling; easy starting and simple air control; and excellent running balance.

Unit has four compressor cylinders all on one side of the engine and spaced five feet apart. This simplifies compressor piping and gives unrestricted access to engine from other side.

(Gas-engine-driven compressor is a product of Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N. Y. . . . or for more information check CP 7831 on handy form, pages 2 and 3.)

**Triggers, cocking, holding devices eliminated from automatic wire stripper . . .**

wire is protected; single squeeze of handles does the job

**Uses:** For stripping all kinds of building and fixture wire.

**Features:** Automatic wire stripper eliminates triggers, cocking, or other holding devices, and a single squeeze of the handles does the job.

**Description:** After wire is stripped, concealed cam holds jaws open until wire is removed. This prevents jaws from snapping back and crushing wire, particularly stranded and fine solid wire.

All parts are sturdily constructed, including handles which are formed steel. Steel blades are hardened and ground to a razor-sharp edge. Upper half of blade is rigid, while lower half moves up and down in precision milled slot. "V" notches assure perfect matching of stripping blades and prevent cutting or scoring of wire.

Blade adjustment screw increases wire range of each stripper and compensates for variations in insulation thickness and adhesive properties.

The "Hi-Speed" stripper is made in seven sizes for stripping No. 8 to 30 solid and stranded wires, POSJ, parallel wire, and 300 ohm flat twin lead-in wire. An adjustable stop is furnished with each tool.

(Wire stripper is a product of Holub Industries, Inc., Dept. CP, 414 De Kalb Ave., Sycamore, Ill. . . . or for more information check CP 7832 on handy form, pages 2 and 3.)

**On the lookout for plant engineering equipment and supplies? . . .**

Your task will be easier if you consult the alphabetical Product Directory, pages 213 to 216, for pumps, valves, electrical items, motors, etc. This is another Putman-style service provided in every issue.



## ARE YOU PAINTING WITH APPLESAUCE?

Corrosive fumes and gases play havoc with "unprotected" structural steel walls and ceilings. But the selection of a satisfactory protective coating isn't always easy. A coating that adequately protects against fume "A" may fail in a week against fume "B."

Corrosion engineers know there is no "all purpose" protective coating. Wisely they steer clear of products whose makers claim *universal* "acid and alkali" resistance. They have learned through bitter experience that all too frequently they end up "painting with applesauce."

The fact that Tygon Paint—first marketed in 1939—has grown increasingly popular with corrosion engineers, stems from two things:

1. IT IS A GOOD PROTECTIVE COATING
2. WE'RE NOT AFRAID TO ADMIT ITS LIMITATIONS

Used as it should be used and under conditions for which it is suitable, Tygon Paint will out-perform and outlast practically any coating on the market. Fifteen years have proved it.

**WRITE FOR THIS FREE BOOKLET**

Bulletin 750 tells how and where to use Tygon Paint . . . how to make sure you're going to get adequate protection at minimum cost. Address Dept. BW354, The U. S. Stoneware Co., Plastics & Synthetics Division, Akron 9, Ohio.



PRODUCT OF



Plastics and Synthetics Division

When inquiring check CP 7833 on handy form, pgs. 2-3



# New Paint Cost Data from Actual Field Tests!



A comprehensive series of field tests was conducted by an independent association of nationally famous corrosion engineers showing the comparative performances of protective coatings under actual corrosive conditions.

The testing method employed by these experts is regarded as the most valid one available—accepted by the leading chemical plants in the country.

*That's why* the Carboline Company used the results of these tests as the scientific basis for determining comparative

- COSTS PER YEAR OF SERVICE
- ESTIMATED LIFE IN YEARS

of 15 different coating systems including furan, vinyl, synthetic rubber and fish oil base formulations—in a sulfuric acid industrial atmosphere.

**Never before has a manufacturer publicized comparative performances of independent laboratory tests.**



**CARBOLINE**  
CORROSION RESISTING MATERIALS

**CARBOLINE COMPANY**

A Division of Mullins Non-Ferrous Castings Corp.  
329 Thornton Avenue St. Louis 19, Mo.

Specialists in Corrosion Resisting Synthetic Materials

When inquiring check CP 7834 on handy form, pgs. 2-3

## MAINTENANCE

**Longer life for parts provided by seal on rotary joint . . .**

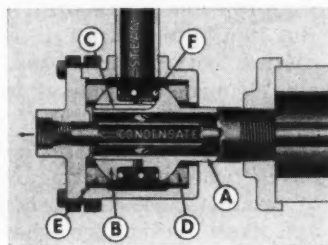
available in two types, unit is packless, self-aligning

**Uses:** Designed for admitting steam or fluids into rotating rolls and cylinders of paper, textile, rubber, and similar machines.

**Features:** Carbon-graphite, self-lubricating seal rings have been increased in thickness at the web to provide an average of 25% longer life. Units are lighter and smaller. Rotating joint is completely packless and self-adjusting. Flexibility is built right in to provide for lateral and angular misalignment.

**Description:** Rotating joints, Series 2000 Type J, are available in through-flow type — which calls for a joint at each end of roll — or syphon pipe type, which has both inlet and outlet connections housed in same joint. On syphon pipe models, head has been simplified to one standard design which permits syphon pipe connection in any direction.

Rotating member of joint consists primarily of two parts — nipple (A) and thrust collar (B) which slides freely endwise over nipple but is keyed to it at (C). Both of these parts have convex hemispherical surfaces, which rotate against matching concave surfaces of two carbon graphite rings (D) and (E). Spring (F) maintains



an initial sealing pressure against these two rings, but actual sealing force is pressure within joint, which forces seal ring (D) against nipple; the higher the pressure the tighter the seal. Ring (E) serves as a bearing for thrust collar.

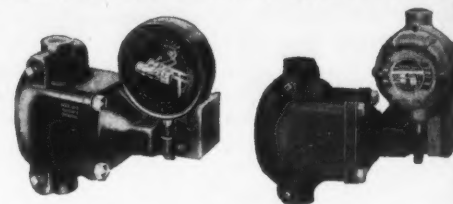
Most sizes of unit may be secured with lugs cast on body, making possible installation with simple support rods. Head and body

## MERCOID LIQUID LEVEL CONTROLS

EQUIPPED WITH SEALED MERCURY CONTACT SWITCHES

For Use With

**GASOLINE, OIL, AMMONIA OR LIQUIDS  
WITH SPECIFIC GRAVITY AS LOW AS .60\***



**FOR OUTDOOR, INDOOR OR EXPLOSIVE ATMOSPHERES**

Mercoird Liquid Level Controls will "make" or "break" contact on approximately 1" level change.

Construction: Float chamber available cast iron, steel or stainless steel. Float—steel, nickel plated, copper, or stainless steel. Packing Gland—brass, monel or stainless steel. Also available packless (torque rod) construction.

Circuit: For various circuit arrangements up to triple pole, double throw. Electrical Capacity: A.C. or D.C. 10 Amp., 115V., 5 Amp., 230V., 3 Amp., 440V.

\*With special construction Mercoird Liquid Level Controls are available for specific gravities as low as 0.45

(Write for Bulletin 39S.)

THE MERCOIRD CORPORATION, 4201 BELMONT AVE., CHICAGO, ILL.

When inquiring check CP 7835 on handy form, pgs. 2-3

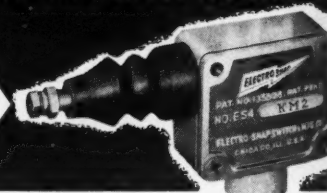
**ELECTRO SNAP**

**ONE WAY**

**IMPULSE SWITCH**

**FOR SIMPLIFIED CONTROL**

**EXCLUSIVE  
ACTUATOR  
LETS YOU  
DO THINGS  
YOU NEVER  
COULD  
BEFORE!**



- **Eliminates Interlocking Switches and Complicated Actuating Dogs**—Ideal for pulsing solenoid valves, air-hydraulic cylinders.
- **Gives More Dependable Operation**—Replaces complicated controls.
- **Lowest Cost of Controls Circuits**—Fewer switches, etc., required.
- **Faster Automatic Operation**—Closer sequencing possible.

Switch rated at 10 amps, 125/250 v. AC. Four models available with over-travel and pulsing strokes from 1/16" to 3/4". Write for Data Sheet ESM-4.

see our catalog in



or write for copy

**ELECTRO-SNAP SWITCH AND MFG. CO.**  
4224 West Lake Street, Chicago 24, Illinois



When inquiring check CP 7836 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**NOW!**

## Low Cost Corrosion Control



Uniform, pore free nickel deposit fully adherent to the steel pipe.

## LECTRO-CLAD

**NICKEL-PLATED SEAMLESS**

## Pipes - Tubings - Fittings

The exclusive time-tested **BART LECTRO-CLAD PROCESS** electrolytically deposits a corrosion resistant nickel lining on the interior surface of steel pipe from 1½" to 24" diameter and in 20-foot random lengths.

Saves critical nickel, is readily available, and is priced competitively.

**LECTRO-CLAD** is the answer to corrosion and contamination problems in the conveying of highly corrosive materials . . . and the cost is surprisingly modest.



Write Dept. CP-4 today for complete details and technical data. Names of large users of **LECTRO-CLAD** available on request.



**BART MANUFACTURING CORP.**  
229 Main Street Belleville 9, New Jersey

Exclusive territories available to qualified distribution organizations.

When inquiring check CP 7838 on handy form, pgs. 2-3

APRIL, 1954

are of close grained heavy cast iron. Nipple is of heavy steel tube, fitted with cast iron collar. Sliding thrust collar is also of cast iron. Spring is formed of steel spring wire, plated to resist rusting.

(Rotating joint is a product of Johnson Corp., Dept. CP, 809 Wood St., Three Rivers, Mich. . . . or for more information check CP 7839, pages 2 & 3.)

### Free-wheeling clutch designed for heavy-duty service . . .

units accommodate up to 8" diameter shaft

**Uses:** Clutches are especially adapted to steel fabricating machinery and rubber company service where 24 hr operation with a minimum of attention is required.

**Features:** Units accommodate up to 8" diameter shafts and are said to be especially designed for extreme service in heavy-duty applications.

**Description:** Clutches have heavy-duty roller bearings for hub supports. Long, multiple rollers operate in a hardened outside casing. Units are positive and non-slipping, but provide low resistance to free-wheeling.

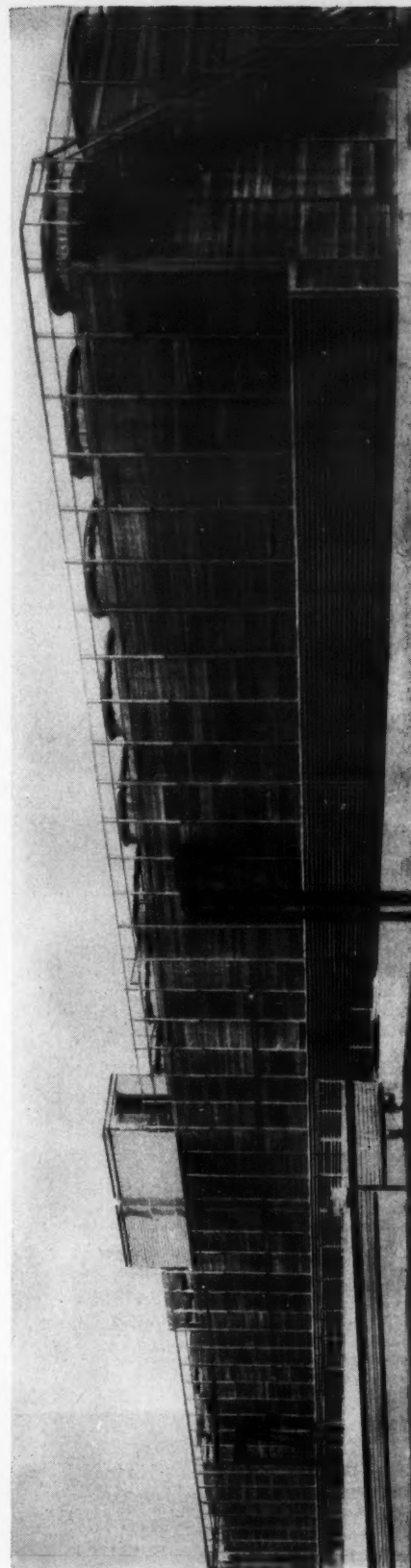
Small OD for any given shaft size makes clutch suitable for machines which have many shafts close together.

(Clutches are a product of Odin Corp., Dept. CP, P.O. Box 6032, Indianapolis 20, Ind. . . . or for more information check CP 7840 on handy form, pages 2 and 3.)

### Dope on diesels given in 8-page bulletin

Bulletin describes diesel engines ranging in size from 2550 hp, 1800 kw to 6150 hp, 4400 kw. Chief uses are in municipal and industrial power plants and central stations.

Bul 224A is issued by Nordberg Mfg. Co., Dept. CP, Chase and Oklahoma Ave., Milwaukee 1, Wis. When inquiring specify CP 7841 pages 2 and 3.



## SPENCER CHEMICAL CO. TAKES THE LONG VIEW!

A rising leader of the chemical industry, Spencer is noted as a firm with its eye on the future. For that reason, Spencer chooses proved, dependable, long-life equipment for their expanding facilities. And that's the reason they chose Pritchard to build this tremendous cooling tower for their Jayhawk Works at Pittsburg, Kansas.

Pritchard has a long record of supplying cooling towers that do their required job better . . . towers that perform at maximum efficiency for a long, long time. When you want more efficient cooling for your chemical operations, be sure to contact Pritchard. You'll get what you want.

Industry's Partner for Progress

**J. F. Pritchard Co.**  
A DIVISION OF J. F. PRITCHARD & CO.  
Dept. 405, 210 West 10th Street, Kansas City 5, Mo.

COOLING TOWERS  
SPECIALIZED HEAT EXCHANGERS  
GAS & AIR TREATING EQUIPMENT

Representatives in Principal Cities from Coast to Coast

When inquiring check CP 7842 on handy form, pgs. 2-3



# HEAT EXCHANGERS

for  
CORROSIVE  
and  
NONCORROSIVE  
LIQUIDS  
and  
GASES

*Industrial*  
tailored  
units

Whether for laboratory or pilot-plant requirements or large-quantity processing, it will pay you to look into the INDUSTRIAL tailored units for heating or cooling liquids or gases. Rather than adaptations of standard units, INDUSTRIAL heat exchangers are engineered and built to individual performance specifications. Depending on size and other operating conditions, the INDUSTRIAL heat exchanger may be a large single- or multiple-pass tube-bundle type or a series, parallel, or series-parallel combination of individual single- or multiple-tube units. In any type unit, thermal shock and the requirements of the corrosive or noncorrosive fluid on the tube or shell side determines the materials of construction. Thus, each INDUSTRIAL tailored heat exchanger embodies the ultimate in operating performance and efficiency at lower initial and maintenance costs.

Get INDUSTRIAL's recommendations for your next heat transfer equipment.



This Bulletin describes the INDUSTRIAL service on heat transfer equipment. Ask for Bulletin 600-2.

5009

**INDUSTRIAL**  
FILTER & PUMP MFG. CO.

5908 Ogden Avenue • Chicago 50, Illinois

PRESSURE FILTERS  
DEMINERALIZERS  
RUBBER LININGS  
HEAT EXCHANGERS  
CENTRIFUGAL PUMPS

When inquiring check CP 7843 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

### Causes of failure eliminated by valve design . . .

disc rotates rapidly at moment of closure

Improved version of Ostlind valve has been announced. This valve, called Gyroseal, is said to eliminate causes of valve failure by having disc rotate rapidly at moment of closure. Foreign particles are thrown off by centrifugal force and turbulence created keeps particles in suspension while disc is gently polished against seat.

Valves are also said to cut downtime by eliminating leakage, unbalanced flow, spalling, wire drawing, chattering, sticking, and necessity for regrinding or replacing disc and seat.

(Valve is a product of Richmond Foundry and Mfg. Co., Dept. CP, 1111 Hermitage Rd., Richmond, Va. . . check CP 7844 on handy form, pages 2 and 3.)

### Electronic control of variable drive widens application range . . .

rpm's are adjustable down to 1/6 of basic speed for continuous duty

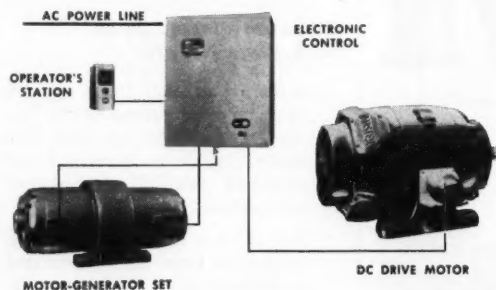
**Uses:** For variable-speed drive applications: in range from 1/8 to 10 hp.

**Features:** Drives are said to be versatile in application because electronic control permits speed to be made responsive to signals based on speed, load, current, voltage, pressure, light, temperature, or time.

**Description:** With Type GV Speedranger, three or two phase AC power is converted by a motor-generator set and by tube electronic rectifiers to supply a DC variable-speed shunt-wound motor.

Available in sizes from 2 to 10 hp, Type GV has basic speeds of 2400, 1750, and 1150 rpm. Drive speeds are adjustable down to 1/6 of basic speed for continuous duty, 50°C, and to 1/10 of basic speed for intermittent duty.

Remote, stepless speed control is provided by knob rotation at a compact (3 x 6 1/4") operator's station. Control cabinet contains tube rectifiers, motor starter (overload protected), protective relays, and other electronic elements. Motor-generator set and DC motor are standard, open, drip-proof, ball-bearing construction.



Available for speed range from 1/8 to 10 hp

## basic PUMP SELECTION GUIDE

Learn  
BASIC FACTS  
before  
deciding  
on TYPE of  
PUMP

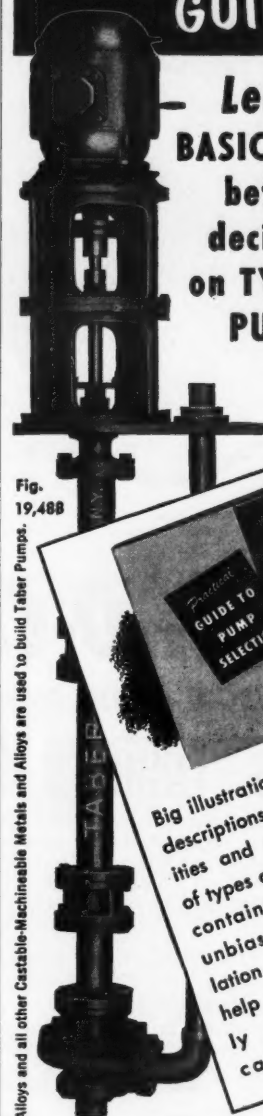


Fig. 19,488

Nickel, Nickel Alloys and all other Castable-Machineable Metals and Alloys are used to build Taber Pumps.

Big illustrations and brief descriptions with capacities and adaptability of types of pumps are contained in this unbiased compilation of facts to help avoid costly misapplication.

WRITE for BULLETIN S-146 on your company stationery, please.

TABER PUMP CO. (Est. 1859)  
320 ELM ST. • BUFFALO 3, N. Y.

Fig. 6041



When inquiring check CP 7845 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Motor-generator cabinet provides space or

Variable-speedranger similar to except the phase AC electronic justable duty and

Optional ginning, reverse cycles.

(Variable-tric Co., D... check

Unstable stored on without

flange on an

Uses: be effective empty can and in ge loads that if stacked

Features: specified so that ea resting on

Description: all storage of individ

With steel contents o are always storage in plete flexi

(Steel sta facturing Youngstov check CP

Outlines combusti

Manufa trols is cluded fuel-air units, a

Bul "C Instrum York 1

Motor-generator set, operator's station, and control cabinet can be located separately or together. This provides maximum mounting flexibility in cases of space or weight limitations.

Variable-speed drive line also includes Type EV Speedrangers in sizes from 1/8 to 1 1/2 hp. They are similar to Type GV in operation and performance except that no motor-generator set is used. Single phase AC power is converted to DC entirely by tube electronic rectifiers. Basic speed is 2400 rpm, adjustable down to 1/6 of basic speed for continuous duty and 1/20 for intermittent duty.

Optional features offered with both drives are jogging, reversing, dynamic braking, and special duty cycles.

(Variable-speed drives are products of Master Electric Co., Dept. CP, 126-89 Davis Ave., Dayton, Ohio ... check CP 7846 on handy form, pages 2 and 3.)

#### **Unstable and semi-stable loads stored effectively in rack without danger ...**

flanged legs allow rigid mounting of each unit on another below

**Uses:** For storage of items that cannot otherwise be effectively unitized. Typical loads may include empty cans, knocked-down cartons, cardboard tubes, and in general, all types of unstable or semi-stable loads that would tend to tumble or crush themselves if stacked without racks.

**Features:** Rack is engineered to accommodate specified pallet sizes. It is built with flanged legs so that each unit will have complete rigidity when resting on another below.

**Description:** Use of racks permits utilization of all storage space from floor to ceiling. Capacities of individual units vary according to size.

With steel side bars spaced at practical intervals, contents of each rack are easily held in position, yet are always visible for identification. In addition, storage installations using these racks permit complete flexibility of location.

(Steel stacking rack is a product of Leebaw Manufacturing Company, Dept. CP, 67 Wayne Ave., Youngstown 2, Ohio ... or for more information check CP 7847 on handy form, pages 2 and 3.)

#### **Outlines many uses for combustion controls**

Manufacturer's line of automatic combustion controls is shown in 4-page bulletin. Products included are master regulators, draft regulators, fuel-air ratio controllers, smoke alarms, power units, and photo-electric ratio controllers.

Bul "Combustion Control" is issued by Standard Instrument Corp., Dept. CP, 350 Fifth Ave., New York 1, N. Y. Specify CP 7848, pages 2 and 3.

**...solid foundation**

**FOR TODAY'S  
COMPACT  
MOTOR DESIGN**

There are, as you know, new NEMA Standards for electric motors ... more power in less space.

When you look for a new NEMA frame motor, look for the one that is built on a solid foundation ... it carries the Fairbanks-Morse Seal of Quality.

**The Standards are new ... But the Idea Is Not**

Like the recent Fairbanks-Morse developments in other lines, the new F-M motor is the result of a basic engineering philosophy: More Performance in Less Space—a 120-year tradition at Fairbanks-Morse. Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois

**FAIRBANKS-MORSE**  
a name worth remembering when you want the best

ELECTRIC MOTORS AND GENERATORS • DIESEL LOCOMOTIVES AND ENGINES • PUMPS • SCALES • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

When inquiring check CP 7849 on handy form, pgs. 2-3



# XACTO...

**THE METER THAT'S  
CHANGING LIQUID  
HANDLING HABITS**



In chemical processing plants XACTO Meters have proved the most effective way to measure liquids . . . accurately and dependably. XACTO safely handles 662 different liquids in processing, blending, packaging and many other operations . . . in batching or continuous operation.



**BOWSER, INC., 1315 CREIGHTON AVE., FORT WAYNE 2, IND.**

REGIONAL OFFICES: Atlanta • Cleveland • Dallas • Fort Wayne • Kansas City • New York • San Francisco • Washington, D. C. • Canadian Plant and Sales, Hamilton, Ont.

When inquiring check CP 7850 on handy form, pgs. 2-3

## AVAILABLE FROM STOCK!



**A NEW QUALITY  
CARRIER AT AN  
ECONOMY PRICE . . .  
FOR 18" 24" 30"  
36" BELTS**

### S-A No. 745 BELT CONVEYOR CARRIER

Now, cut costs and simplify many carrier applications by ordering new S-A 745's direct from stock! Quality design and construction includes rigid welded steel frame—S-A spun-end rollers made from a single piece of heavy gauge steel tubing—labyrinth seal that keeps dirt out of ball bearings, and grease in—3-shot Alemite lubrication. Rollers can be disassembled without tools and are interchangeable.

**STEPHENS-ADAMSON MFG. CO.**  
Standard Products Division  
11 Ridgeway Avenue, Aurora, Ill.  
Please send me Bulletin on new S-A  
No. 745 Carriers

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

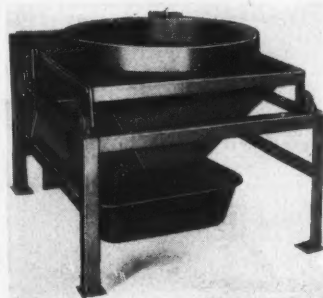
**MAIL  
COUPON  
FOR FULL  
DATA**

When inquiring check CP 7851 on handy form, pgs. 2-3

## MAINTENANCE

### Add screen separator to line of equipment

Addition to line of manufacturer's industrial equipment is a medium size screen separator built to use a standard 24" diam foundry riddle. Unit is operated by a ball bearing AC motor through a nylon eccentric bushing. Stroke of screen



Built to use a standard 24" diam  
foundry riddle

movement is readily adjustable from 0 to 1½" by loosening or tightening one bolt. Bronze bushings are used throughout. Dimensions of machine are 37 x 29 x 24" high.

(Screen separator is a product of Rampe Mfg. Co., Dept. CP, 3320 St. Clair Ave., Cleveland 14, Ohio . . . or for more information check CP 7852, pages 2 and 3.)

### Announce 1954 edition of heating catalog

The 1954 edition of company's catalog on Calrod electric heaters and heating devices is available. In two colors and 60 pages it describes units in terms of application, special features, and installation.

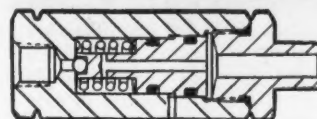
More than 175 photographs and drawings illustrate various products, including immersion, strip, cartridge, tubular, insertion, and fin heaters, melting pots, thermostats, switches, and oven heaters.

Indexed by processes and application, catalog also contains methods for determining power requirements and heat losses for many applications.

Cat GEC-1005E is issued by General Electric Co., Dept. CP, 1 River Rd., Schenectady 5, N. Y. When inquiring specify CP 7853, pages 2 and 3.

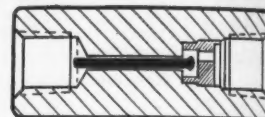
## REPUBLIC VALVES

INDUSTRIAL • CHEMICAL • AIRCRAFT



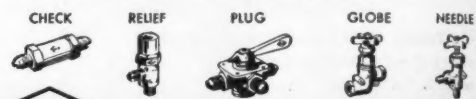
### REPUBLIC GAGE PROTECTOR

**PROTECT** your expensive gages from severe pressure fluctuations and shock with Republic gage protectors and snubbers. Designed for a wide range of settings and service conditions. Standard units are brass, with pipe thread connections as shown. Other materials and connections are available on special order. Gage protectors fit standard gage connections, 15 to 5,000 psi.



### REPUBLIC PRESSURE GAGE SNUBBER

Write for complete catalog and nearest distributor.

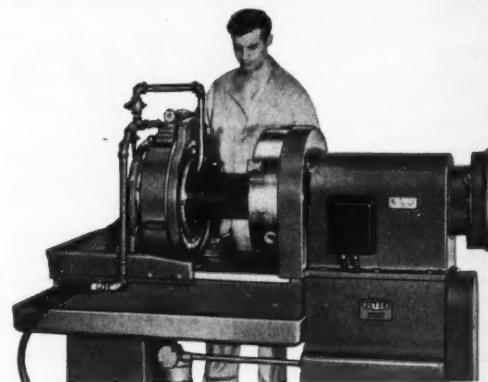


RM

**REPUBLIC MANUFACTURING CO.**

1930 WEST 77TH STREET • CLEVELAND 2, OHIO

When inquiring check CP 7854 on handy form, pgs. 2-3



## The OSTER "WILCO"

**FAST...FLEXIBLE...EFFICIENT**

The Oster No. 716 "Wilco" threads a wide range of pipe without die-head change. You can change sizes in seconds. A 2½" pipe, a 4" pipe, a 6" pipe, one die-head handles them all. Standard pipe range of the No. 716 "Wilco" is 1" to 6"; bolt range 1" to 4".

For the full story on the complete Oster line of threading machines see your local Oster Distributor.

**THE OSTER MANUFACTURING CO.**  
Main Office and Factory:  
2032 East 61st St. • Cleveland 3, Ohio

Builders of Cost Reducing Threading Equipment since 1893

When inquiring check CP 7855 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Pick-up is 50 to 100% faster due to air-handling feature of vacuum cleaner . . .**

motor unit is removable for use as a blower

**Uses:** For general industrial vacuum cleaning applications, unit is said to be ideal for sump and boiler cleaning.

**Features:** Model 500-55 cleaner is said to pick up dirt, chips, liquids and cutting oils from 50 to 100% faster due to air-handling feature that produces more power than a vacuum of the same motor rating. Fan and fan chamber are designed to give extreme power and suction, according to manufacturer.

Machine can pick up wet or dry in large amounts. Water can be picked up at rate of 40 gal/min. Cleaner lid fits any 55 gal drum, permitting shifting from one drum to another in a matter of seconds for easier disposal.

**Description:** Tank is equipped with dump valve for simple emptying. For dry pick-up, large

For wet or dry pick-up

tank and big filter bag allow machine to operate over a longer period.

Dolly is equipped with large Neoprene rubber casters for easy rolling under heavy loads. Dolly also has a spring-action handle which is held close to tank when not in use. Handle extends to proper height for pulling.

Motor unit is removable for use as blower or portable vacuum cleaner.

(Vacuum cleaner is a product of American Cleaning Equipment Corp., Dept. CP, 2029 S. Halsted St., Chicago 8, Ill. . . or for more information check CP 7856 on handy form, pages 2 and 3.)

#### **Demonstrates easy method for joining pipes**

Pocket-size folder explains use of compression couplings on cast-iron, steel, and asbestos-cement pipe. Photos show speedy method of on-the-job assembly, and information on sizes, and specifications is also included.

Folder No. 102 is issued by Dept. K-6, Morris Coupling and Clamp Co., Dept. CP, Ellwood City, Pa. When inquiring specify CP 7857 on handy form, pages 2 and 3.

## TESTS DEMONSTRATE EFFECTIVENESS OF...

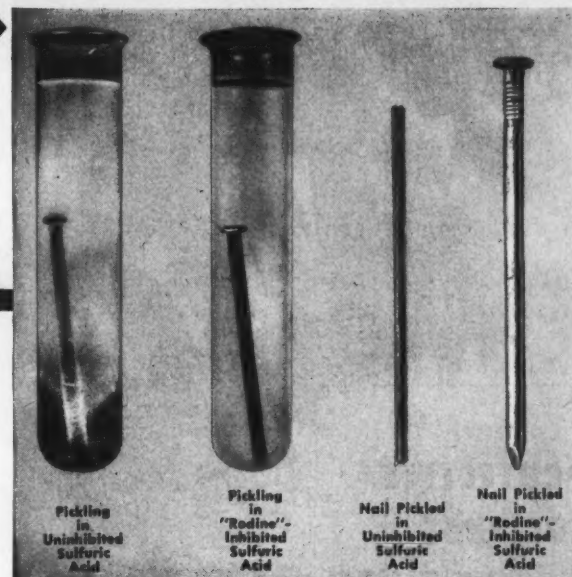
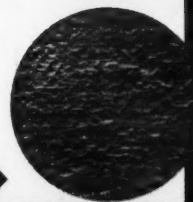
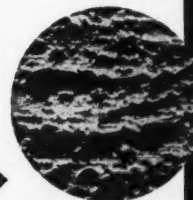
Trade Mark  
**RODINE**  
Reg. U.S. Pat. Off.

### PICKLING ACID INHIBITOR

*"Rodine" more than pays for itself in savings of acid and metal. More uniform pickling and better pickled surfaces are obtained when "Rodine" is used in acid pickling baths.*

This steel surface was pickled in an uninhibited acid bath. Note the deep pits, and that the surface is visibly crystalline.

This surface was pickled exactly like the one above except that "RODINE" was added to the acid solution. Only scale pockets and roll marks are visible; no pitting occurred.



The photographs above illustrate the beneficial effect produced by a small amount of "Rodine" in a pickle bath.

A. Both test tubes contain a 10 per cent by volume solution of sulfuric acid. In the left-hand tube, no further additions have been made to the acid. Notice the gas bubbling off the nail. This is hydrogen, caused by the action of acid on good metal. In the right-hand tube, "Rodine" has been added in an amount equal to 1 per cent by volume of the concentrated acid. Notice the absence of bubbling in this tube. "Rodine" prevents the formation of hydrogen that results from dissolving metal.

B. Both nails after being pickled for the same time. The nail pickled with "Rodine" has lost little weight and has retained its original luster and appearance. The nail pickled without "Rodine" is no longer a nail. "Rodine" prevents the acid from dissolving metal.

CHEMICALS  
**ACP**  
PROCESSES

**AMERICAN CHEMICAL PAINT COMPANY**

General Offices: Ambler, Penna.

Detroit, Michigan

Niles, California

Windsor, Ontario

When inquiring check CP 7858 on handy form, pgs. 2-3



**PROTECTIVE  
COATINGS  
TWELVE TIMES  
AS THICK...**

## ...ATLAS NEELIUM®

With ATLAS NEELIUM, you apply *individual coats as much as twenty mils thick*. You use the same amount of NEELIUM as other materials, but it takes considerably less time . . . considerably less labor . . . for a more resistant coating of equal thickness.

Here is the sensible approach to a better protective coating at a lower overall cost. NEELIUM cuts labor expense which usually runs 3 to 5 times the cost of good coating materials.

NEELIUM is an ideal coating both chemically and physically. It is Neoprene based, and provides a surface that is inert and impervious to an extremely broad range of corrosives in the form of fume or splash. It resists acids, alkalis, oils, greases, salts, sunlight and weathering. NEELIUM cures at room temperature to a tough, resilient film with remarkable abrasion resistance, assuring long service under the hardest conditions.

Write for full information. Request Bulletin 7-55E.

**ATLAS PRODUCTS STAND**  
...between your process and corrosion



Corrosion-proof: Cements • Coatings • Vessel Linings • AMPCOFLEX®

When inquiring check CP 7859 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

### Variety of uses for versatile vacuum cleaner

Catalog describes furnace and boiler cleaners which are also used for wet-and-dry pick-up. Versatility of various models is shown. It is said they can be used in heavy rains to pick up water off cellar floors or to clean walls and floors of any material. Units are portable and can operate on AC or DC. Complete specifications are given for models shown.

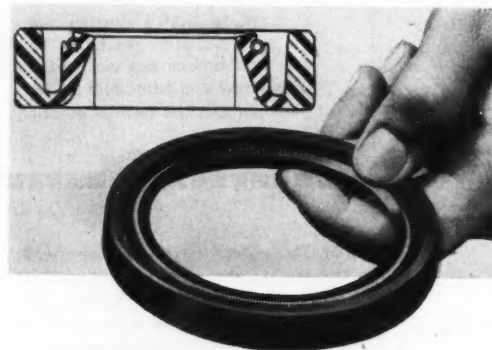
Cat "Furnace and Boiler Cleaners" is issued by Empire Chemical Products Co., Dept. CP, 10 Longworth St., Newark 2, N. J. When inquiring specify CP 7860 on handy form, pages 2 and 3.

### Design of molded oil seal results in minimum wear, reduced shaft torque

**Uses:** For oil seal applications over a wide range of service conditions and temperatures.

**Features:** Design of molded oil seal is said to result in minimum seal wear, low frictional heat, and less drag (reduced torque) on shaft. Narrow lip bearing area also reduces need for lubrication to a minimum, yet seal receives a greater amount of lubrication in proportion to its surface.

**Description:** Seal is designated LPD (Line-contact Proportionate Design.) Line-contact refers to lip of seal which contacts shaft in thin line around shaft circumference. Proportionate Design refers to relationship between lip area and hinge area which stay proportionately the same throughout range of flange widths and shaft sizes. This means that sealing characteristics are constant whether seal is large or small.



Composition heel designed for pressed fit into bearing cavity

In this design the lip is husky in cross-section and hinge is proportionately sturdy. Hinge controls lip contact, and its flexibility enables seal to adapt itself to shaft run-out and minor shaft eccentricities. Lip area provides a deep retainer groove for garter spring that further assures sealing effectiveness.

Spring holds lip in light but positive contact with

## Catawissa PERFECT SEAL Unions

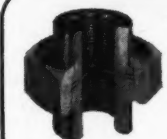
**HOT FORGED** from solid, rectangular steel bars, designed and produced for dependable, long-life service under the severest piping conditions!

**A TYPE FOR EVERY USE!**  
FOR ALL PRESSURES!  
FOR ALL TEMPERATURES!



### Standard & Double Extra Heavy UNIONS

Available with screwed or socket weld ends. 3000-lb. sizes 1/4" to 3"; 6000-lb. sizes 1/4" to 2".



### ORIFICE UNIONS

With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

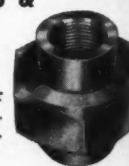
### MALE & FEMALE UNIONS

With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.



### FULL STAINLESS & FULL ALLOY STEEL UNIONS

With screwed or socket weld ends. 3000-lb. and 8000-lb. service.



WRITE FOR CATALOG 11  
showing the complete Catawissa  
line of Perfect Seal products

**CATAWISSA VALVE AND  
FITTINGS COMPANY**

620 Mill St. • CATAWISSA, PA.

When inquiring check CP 7861  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

shaft. Retaining groove holds it firmly during installation and operation. Diameter and tension of spring are predetermined to maintain lip pressure at minimum necessary to assure proper sealing.

Seal has heel of composition material designed for press fit into bearing cavity. Since heel will conform to irregularities, machining of cavity to close tolerances is unnecessary. Because of this heel, seal can be removed or replaced without damage to either seal or cavity.

(Molded oil seals are products of Johns-Manville, Dept. CP, 22 E. 40th St., New York 16, N. Y. . . . or for more information check CP 7862 on handy form, pages 2 and 3.)

### Better cooling, easier servicing result from sectionalized cylinder on compressor

Improved design is featured on manufacturer's Class ATH air and gas compressors which employ sectionalized cylinders arranged in three pieces, with inlet and discharge valves in fronthead and backhead. All are equipped with cylinder liners as standard.

Several advantages are said to result from design. First, since cylinder is sectionalized and readily disassembled, liner may be speedily removed without disconnecting inlet or discharge air piping. This permits easier servicing of piston rings, piston or liner, and cooling water passages.

Second, valves in heads with this sectionalized cylinder construction allow better cooling and provide lower temperature throughout cylinder and valves. Cooling jackets adjacent to cylinder heads are generous in size. Thus, design incorporates increased cooling surface where it is needed most. Moreover, design provides cross-flow of cooling water since it is admitted on lower side of one head and discharges on upper side of the other. Compressors are available in single stage 100 psig discharge pressure sizes.

(Air and gas compressors are a product of Pennsylvania Pump and Compressor Co., Dept. CP, Bushkill Rd., Easton, Pa. . . . or for more information check CP 7863 on handy form which is located between pages 2 and 3.)

### Demonstrates outstanding features of crane-drive equipment

Illustrated 12-page bulletin uses cutaway and exploded views of crane motors and control, in addition to speed-load and performance curves. Equipment is designed to meet varied duty-cycle requirements, from accurate spotting by machine-shop cranes to high-speed lowering by magnet cranes. Built-in magnetic brake plus other components and accessories are described.

Bul GEA 5408A is available from General Electric Co., Dept. CP, Schenectady 5, N. Y. When inquiring specify CP 7864 on handy form, pages 2 and 3.



# Heat in a Hurry—at Low Cost!

## CHROMALOX

### Pre-engineered PACKAGED Electric Heaters

COMPLETE HEATING UNITS READY FOR YOUR JOBS—FROM THE WORLD'S LARGEST STOCK OF STANDARD EQUIPMENT

#### ARTM Automatic Immersion Heaters

BUILT IN

- ELEMENTS
- THERMOSTAT
- CONTROL
- SCREW-PLUG



①

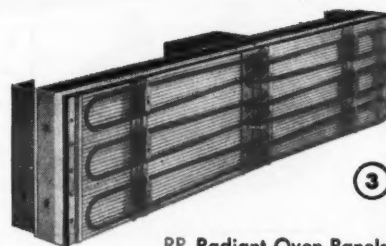
#### NWH Automatic Circulation Heaters

BUILT IN

- ELEMENTS
- THERMOSTAT
- HEATING CHAMBER
- INSULATION
- MOUNTING LUGS



②

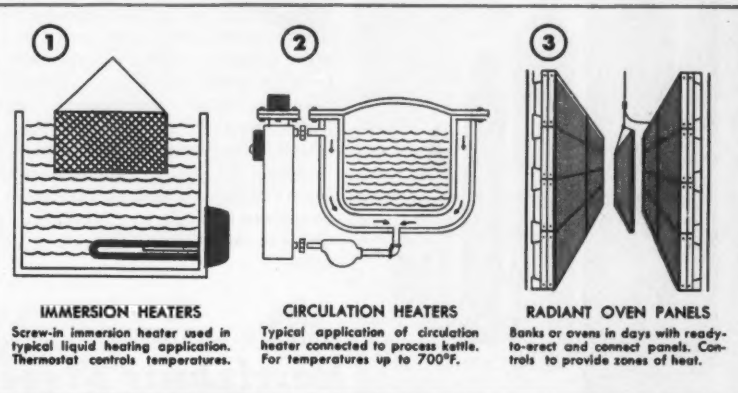


③

RP Radiant Oven Panels

BUILT IN

- STEEL FRAME
- METAL SHEATHED ELEMENTS
- REFLECTORS
- PREHEATING AIRWAYS
- INSULATION
- BUS BARS



IMMERSION HEATERS

Screw-in immersion heater used in typical liquid heating application. Thermostat controls temperatures.

CIRCULATION HEATERS

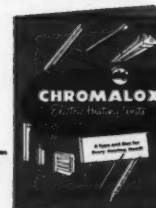
Typical application of circulation heater connected to process kettle. For temperatures up to 700°F.

RADIANT OVEN PANELS

Banks or ovens in days with ready-to-erect and connect panels. Controls to provide zones of heat.

CHROMALOX PACKAGED ELECTRIC HEATERS are ready to go to work on the heating jobs in your plant. Easy to install, they may be used as permanent or portable heat sources to give you clean, dependable, accurately controlled heat at temperatures required. Heaters are available for degreasing, cleaning, pickling and plating; for melting greases, asphalts and similar viscous fluids; for heating air and other gases; and for preheating fuel oils and superheating steam.

Nationwide application assistance, plus immediate delivery from the world's largest stock of electric heating equipment.



GET MORE DETAILS  
SEND COUPON TODAY

1C-75

EDWIN L. WIEGAND COMPANY, Industrial Division  
7517 Thomas Boulevard, Pittsburgh 8, Pa.

- ☐ Please send me Chromalox Catalog 50.  
☐ Have a Chromalox Application Engineer get in touch with me.

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## CHROMALOX

*Electric Heat for Modern Industry*

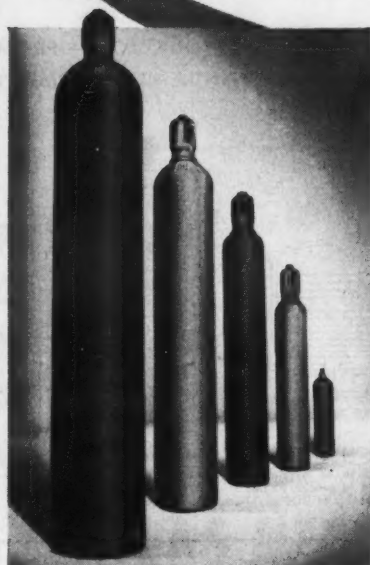
DESIGNERS AND MANUFACTURERS OF ELECTRIC HEATING  
UNITS EXCLUSIVELY SINCE 1917

When inquiring check CP 7865 on handy form, pgs. 2-3



## Need Cylinders? Cylinders Problems?

consult **HARRISBURG STEEL**



Natural... the biggest producer builds them best. In a complete range of sizes and capacities from 14 to 400 cubic feet... in both Domestic and Export types... to I.C.C. Specifications... for storage and transportation of fixed, liquid, and medical gases. If you need cylinders or have a technical problem concerning cylinders... consult us. Or write for a catalog and prices... today.

HSC-CC-1/54



When inquiring check CP 7866 on handy form, pgs. 2-3

## NO HAND TRUCKERS NEEDED



Swing it  
left or right  
while running

With the POWER-CURVE-LOADER on the job your bags flow swiftly all the way from packing station to loading spot inside box car or truck without a hand laid on them! Cut loading crews to one or two men.

Finger-tip controls make it self-propelled—self-retracting and reversible. Stackers never lift a bag... merely swing them from discharge plate to the stack.

A POWER-CURVE-LOADER PAYS FOR ITSELF IN MONTHS.

**POWER-CURVE  
CONVEYOR CO.**

2185 SOUTH JASON STREET • DENVER 19, COLORADO

When inquiring check CP 7867 on handy form, pgs. 2-3

WRITE FOR BULLETIN #50. We offer a no-obligation engineering service, blue-printing your specific bag handling problem... for Car Loaders, Conveyors, Bag Flatteners and Elevators.

## ENGINEERING & MAINTENANCE

In addition to removing rust, phosphate coating deposited by metal cleaners...

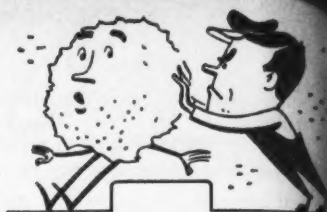
materials are especially compounded to meet requirements of each installation

**Uses:** For products that are too large or heavy to be phosphate coated by normal methods, and for manufacturers whose production does not warrant elaborate equipment for phosphate cleaning.

**Features:** Phosphoric acid cleaners provide two functions. In addition to removing rust, light scale, shop dirt and oil, cleaner also deposits a fine-grained crystalline structure of iron phosphate that becomes chemically interlocked with metal itself. This coating contains microscopic crevices into which paint flows and is securely locked. Result is that peeling and flaking is retarded, corrosion is prevented, and blistering due to corrosive action taking place under paint film is virtually eliminated, according to manufacturer.

**Description:** Cleaners, 800 Series, are specially compounded to meet particular requirements of each installation. They can be applied by any practical method such as brush, sponge, dipping, or flowed-on, and can be specified to incorporate such properties as detergency, oil solvency, rust and scale removal.

(Metal cleaners are a product of Detrex Corporation, Dept. CP, Box 501, Detroit 32, Mich. ... or check CP 7868 on handy form, pages 2 and 3.)



## The case of the hesitant sand...

Yes, a New England foundry really did have a case like this. As the sand started down through the overhead bins and hoppers, it paused uncertainly, sort of reared back and held up production... something terrible.



Fortunately, the foundry superintendent called us for advice. In short order a battery of CLEVELAND vibrators were installed on the bins, and the sand hasn't hesitated ever since.



Whatever your hesitant material... cement, steel chips, ore... just tell us — or ask for our detailed literature.

**AIR and ELECTRIC**



2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 7870 on handy form, pgs. 2-3

CHEMICAL PROCESSING



11 x 15" N Fitting.

### Typical Lenape Fittings

- 11 x 15" Type L 150 PSI in steel, Everdur, and 304 Stainless.
- 11 x 15" Type N 450 PSI for general application.
- 11 x 15" Type S 250 PSI with external split recessed clamp plate for paper machine dryers.
- 12 x 16" Type N 450 PSI for general application.
- 12 x 16" Type HP 800 PSI for heavy duty.
- 14 x 18" 300 PSI Hinged for beverage tanks.
- 18 x 24" 200 PSI for large clean-outs.

Full details are found on pages 35-42 of Lenape Catalog 9-49

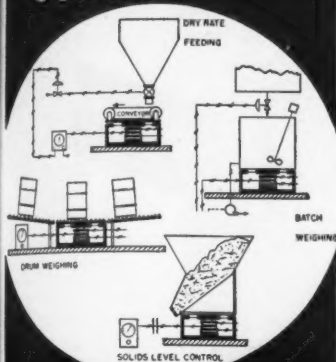


LENAPE HYDRAULIC PRESSING & FORGING CO.  
DEPT. 100 WEST CHESTER, PA.

RED MAN PRODUCTS

When inquiring check CP 7869 on handy form, pgs. 2-3

## a NEW tool for process control



### W/C Weighing Scale PNEUMATIC-PLATFORM TYPE

- For batch or continuous weighing of solids or liquids
- For remote indication or continuous flow control
- With accuracy above 0.25% of range
- Highly sensitive, extremely rugged
- No springs, knife edges, or levers
- Unaffected by off-center loading on platform
- Unaffected by vibration

Here's the latest step toward continuous process control of your plant—especially in explosive or dusty atmospheres. It's the new W/C Weighing Scale . . . fully tested, proved, and guaranteed to cut processing time or improve your yield. Based on the force-balance principle, the W/C Weighing Scale translates weight into a pneumatic output signal. It is furnished complete with a remote panel containing a weight indicating scale 45 inches long.

Available in ranges up to 5000 pounds, it is the first device that reliably uses weight as a criterion of measurement to meet the demands of modern process control.

Write for Catalog which gives complete details, engineering drawings, and calibration curves.

**WEIGHING COMPONENTS, INC.**  
44 Palmer Ave. • Haiboro, Pa.

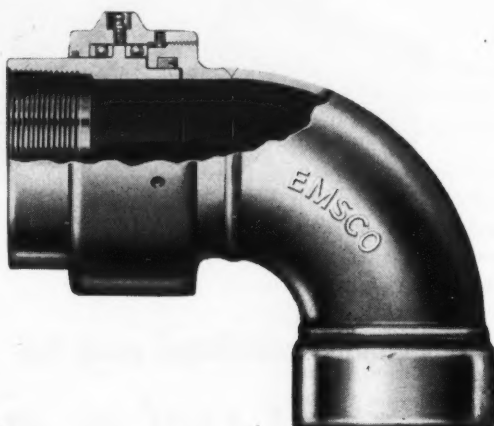
When inquiring check CP 7871 on handy form, pgs. 2-3

### Easy turning at low torque featured by joint added to swivel fitting line

**Uses:** For applications and pressures to which schedule 40 pipe would be subjected.

**Features:** Swivel fitting is said to have excellent free turning qualities from the standpoint of easy turning at low torque, low resistance to flow, and all around safety. Thrust load is taken directly through center of balls. Hardened and ground races on which a double row of ball bearings rotate are perpendicular to line of force.

Packing materials, including Teflon for corrosive and other services, are independent of ball rows and are unaffected by ball race wear. Packing can be replaced and adjustments for normal wear made while fitting is in service.



**Description:** Type LPR ball bearing swivel fitting illustrated above is designed for a maximum pressure of 1000 psi at a maximum temperature of 225°F. Over 500 various types, styles, and pipe sizes ranging from 1/4 to 4" are offered. End connections may be scarfed, bored for welding, threaded, or flanged to meet specifications.

(Swivel fittings are products of Dept. 15, Emsco Mfg. Co., Dept. CP, P.O. Box 2098, Terminal Annex, Los Angeles 54, Calif. . . or for more information check CP 7872 on handy form, pages 2 and 3.)

### Aims at simplifying pricing of grinding wheels

Simplified net pricing schedule for grinding wheels allows direct computation of net prices for straight side, cup and cone wheels, and other items. Procedure aims at eliminating complicated schedules, list price additions, and variety of multipliers now in effect.

Bul "Grinding Wheel Pricing" is issued by United States Rubber Co., Dept. CP, 1230 Avenue of the Americas, New York 20, N. Y. When inquiring specify CP 7873 on handy form, pages 2 and 3.

## Announcing the **POWRWORKER "26"**

**FEATURE BY FEATURE,  
IT'S ENGINEERED TO  
MEET YOUR OWN  
HANDLING REQUIREMENTS**



Pallet: 4000,  
6000 lbs. cap.



Platform: 4000,  
6000 lbs. cap.



Stacker: 1500,  
2000, 2500,  
3000 lbs. cap.



Detailed job-studies in customer plants, warehouses and terminals dictated the features of the POWRWORKER "26". No truck on the market today can match the POWRWORKER'S combination of user-benefits:

- **Maximum Maneuverability**—Only 26" longer than the load, the shortest standard truck on the market.
- **Light Weight**—Completely fabricated construction combines maximum strength with least weight.
- **Stability**—Close-to-the-floor, low center of gravity.
- **Great Efficiency**—Double reduction of spur gears gives maximum ton-miles at least power cost.
- **Balanced Load Distribution**—Double lift cylinders for smooth lifting and lowering.
- **Safety**—Deadman switch cuts power when brake is applied, handle automatically returns to brake-position.
- **Easy to Service**—All operating units accessible without lifting or dismantling. Drive wheel tire is quickly demountable.

We invite you to compare the 1954 POWRWORKER with any truck on the market! For details, call your local Clark dealer, listed in the Yellow Pages. Or send the coupon for literature.

Ask your Clark dealer about Clark's low-cost Pay-As-You-Go leasing plan.

### CLARK EQUIPMENT

POWRWORKER SECTION  
Industrial Truck Division

**CLARK EQUIPMENT COMPANY**  
Battle Creek 9, Michigan

- ☐ Please send POWRWORKER literature.  
☐ Have representative call.

Name \_\_\_\_\_

Firm Name \_\_\_\_\_

Street \_\_\_\_\_

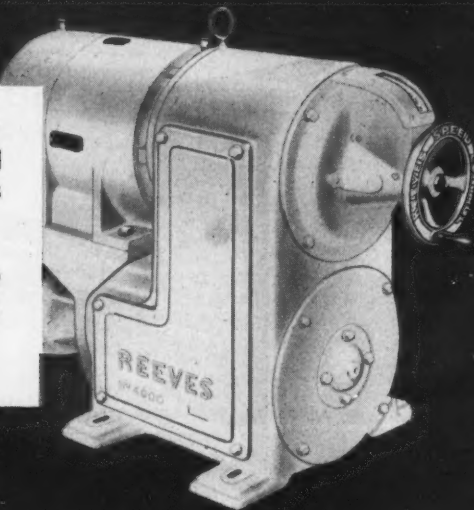
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 7874 on handy form, pgs. 2-3



## Choose New or Old NEMA Motors

**REEVES  
Vari-Speed  
Motodrives  
are  
available  
with either  
new or old  
NEMA  
motors!**



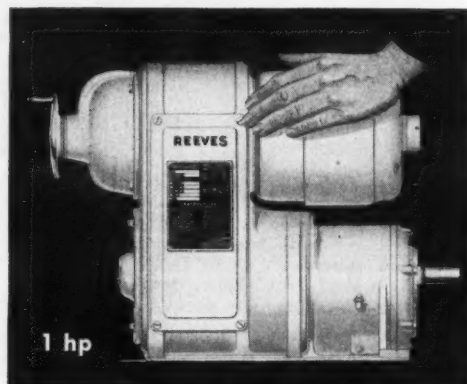
## ... but always choose **REEVES**

With each new development and improvement in industrial progress—such as the new, smaller size NEMA Motors—you can always look to REEVES to be in step with the latest, most modern developments in speed control. You don't have to wait for new designs or adaptations. In keeping with their fine pioneer tradition, REEVES offers you *now* all the advantages of *smaller* Motodrives in practically every case when you order 1 hp or 2 hp drives with the new NEMA Motors. Write today for complete details to Dept. CP5-G.

**Smaller  
MOTORS...**

**Smaller  
MOTODRIVES!**

for 1 hp or 2 hp  
with new frame  
NEMA motors



REEVES PULLEY COMPANY • COLUMBUS, INDIANA

When inquiring check CP 7875 on handy form, pgs. 2-3

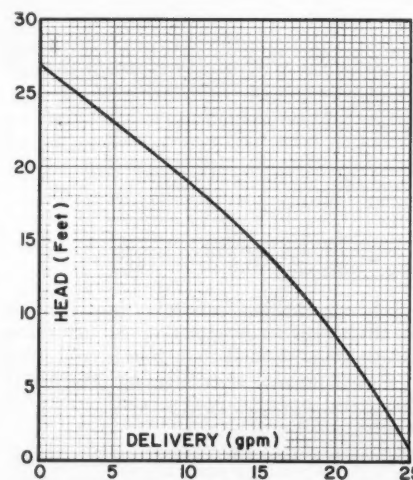
*engineering  
and maintenance*



Pipe-mounted circulator is quiet  
in operation

Fractional hp centrifugal pump has

***no shaft seal or motor bearing  
to require service***



Pump, as shown by performance curve  
(water), gives heads over 25 feet

**Impeller of stainless steel leak-  
proof unit is driven by  
magnetic field**

**Uses:** For circulator applications with fresh or salt water, solvents, corrosive or hazardous fluids, petroleum products, chemicals, and other liquids.

**Features:** Motor and pump are in one sealed, leakproof unit. Pump has no shaft seal or stuffing box and requires no lubrication. It is installed like a plumbing fitting as a connecting link between two pipes, eliminating couplings and alignment problems.

The only moving part in the pump is a stainless steel, closed impeller attached to magnetically-driven, nickel-clad rotor. Design provides quiet operation. Motor windings are fully enclosed and isolated

from pumping chamber by a stainless steel liner, eliminating contamination of fluids pumped. Lightweight unit is easily mounted in any position.

**Description:** All pumping parts of standard Dynapump are fabricated of 18-8 stainless steel. For highly-corrosive applications, special materials are available. Buna-N O-rings and flange gaskets, and graphite bearing are standard.

Unit handles fluids up to 210°F, with other models available for fluid temps to 500°F. Standard working pressure is 150 psi. Pump delivers up to 25 gpm — gives heads to over 25 ft.

Totally-enclosed motor is 1/8 hp, 115v, single phase, 60c. It is supplied with thermal starting and overload relay. Larger hp, explosion-proof, and hermetically-sealed submersible units can be furnished.

Standard flanges for pump are for one inch pipe support mounting. Accessory brackets for panel or floor mounting are available.

(Magnetic pump is a product of The Fostoria Pressed Steel Corp., Dept. CP, Fostoria, Ohio . . . or for more information check CP 7876 on handy form, pages 2 and 3.)

#### **Low pressure drop featured on check valve . . .**

spherical poppet nose and matching seat assure leak-proof seal, because of self-alignment

**Uses:** For check valve applications.

**Features:** Spherical poppet nose and matching seat in valve assure leak-proof seal, because they are self-aligning. Caged poppet is said to give low pressure drop, practically no flow restriction, in non-surge hydraulic systems to 3000 psi.

**Description:** While standard opening pressure is as low as 3 oz, stronger springs are available so these units can be used as combination in-line relief-check valves.

Free-Flow check valves are available in all combinations of tube and pipe ports, for operating temperatures of -65°F to 200°F, and higher on order. They are made in all metals, in sizes 1/8 to 1".

(Check valve is a product of Republic Mfg. Co., Dept. CP, 1930 W. 77th St., Cleveland 2, Ohio . . . or for more information check CP 7877 on handy form, pages 2 and 3.)

Relative humidity control with sulfuric acid  
— nomograph on page 194

## **Blaw-Knox electro-vapor kettles®**

*squeeze the most  
from each BTU*

Blaw-Knox Electro-Vapor Kettles put heat to work quickly, efficiently and with a minimum of loss.

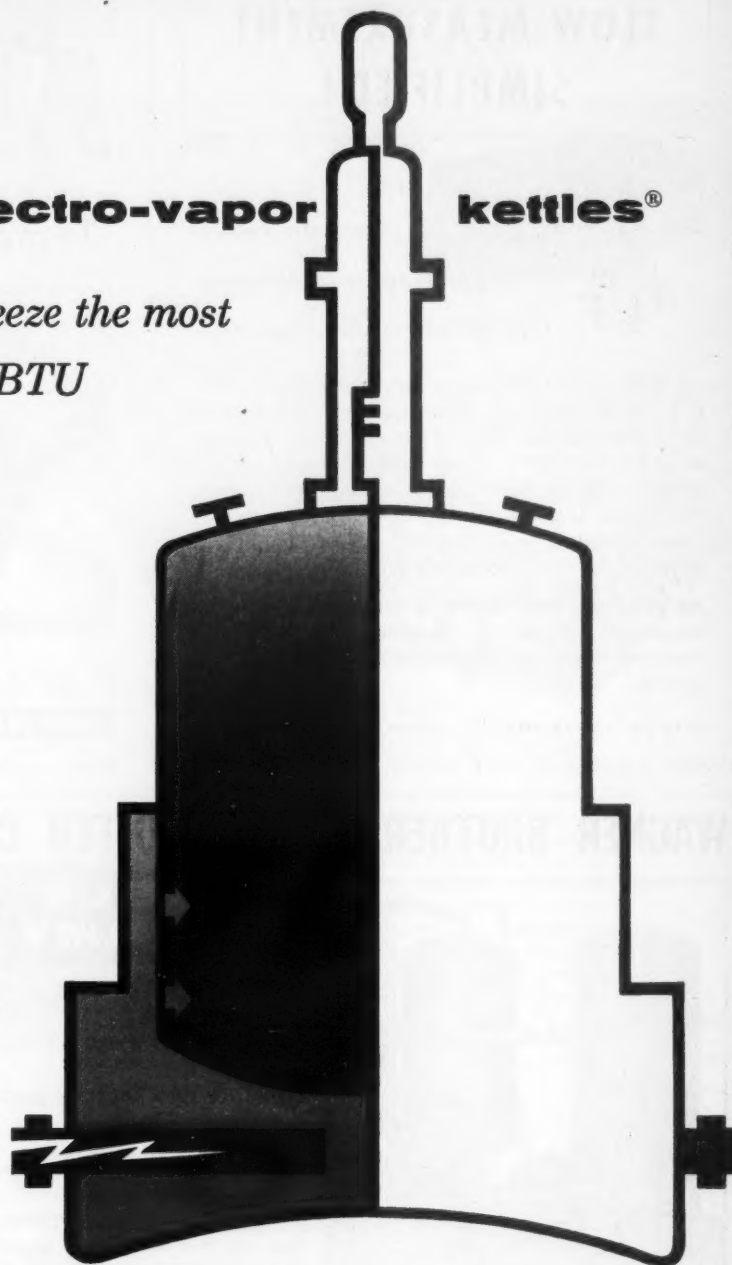
From a cold start, electrical immersion heaters rapidly vaporize Dowtherm which transfers its latent heat to the inner vessel by condensation. The vaporization-condensation cycle is continuous.

The heat is uniform, accurately controlled and most efficiently utilized. There are no boilers or brick settings to heat—no piping systems through which heat is lost.

Blaw-Knox Electro-Vapor Kettles are simple in operating principle and practically maintenance-free.

The initial cost and space requirements for these compact, self-contained units are less than those for standard Dowtherm heated vessels, which require external boilers and piping systems.

For additional information, write for Blaw-Knox Bulletin 2324. There's no charge or obligation.



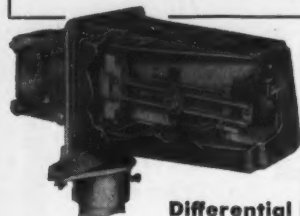
### **BLAW-KNOX COMPANY**

Blaw-Knox Equipment Division  
Process Equipment Department  
Pittsburgh 38, Pennsylvania

When inquiring check CP 7878 on handy form, pgs. 2-3



## FLOW MEASUREMENT SIMPLIFIED!



With the New  
**Taylor TRANSAIRE\***  
Differential Pressure Transmitter

**A**STREAMLINED, light-weight pneumatic transmitter, designed to meet present day requirements for a rugged, dependable and accurate instrument to measure flow, liquid level, or specific gravity. Compact design, force-balance action, dry (mercury-less) type. Ten-to-one adjustability in each of two ranges: 20-200" water; 80-800" water. Inexpensive, simple to install. Economical and easy to maintain.

Ask your Taylor Field Engineer for full details of this new transmitter, or write for Bulletin 98226. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

\*Reg. U. S. Pat. Off.

**TAYLOR INSTRUMENTS MEAN ACCURACY FIRST**

When inquiring check CP 7879 on handy form, pgs. 2-3

## Depend on **AUTO-LITE**

for  
**Temperature Indication**

You Benefit from  Eye-Level Readings



3-way  
adjustable  
mounting

Model F-1  
temperature indicator

Auto-Lite offers many thermometer styles, permitting plant-wide temperature observation at low cost. Standard temperature ranges from minus 60°F to plus 750°F. Send for latest catalog showing various types.

Rigid stem or capillary tubing for EYE-LEVEL remote reading. Priced from \$22.

THE ELECTRIC AUTO-LITE COMPANY  
INSTRUMENT AND GAUGE DIVISION  
TOLEDO 1, OHIO  
NEW YORK • CHICAGO • SARNIA, ONTARIO

**TEMPERATURE INDICATORS & RECORDERS**

When inquiring check CP 7880 on handy form, pgs. 2-3

## WAGNER BROTHERS FILTERS OFFER CHEMICAL PROCESSORS

**DOUBLE  
ECONOMY**

**LOW OPERATING COST • LOW MAINTENANCE COST**

**CONSIDER TWO FACTORS BEFORE YOU SPECIFY FILTERING EQUIPMENT:**

- 1 The gallons of solution which can be efficiently filtered in a given period of time.
- 2 The cost of maintaining the filtering mechanism.

It's an established fact that Wagner Brothers Filters have a higher effective flow rate than any other equipment with equal filtration area . . . thus, gallon for gallon, it delivers more pure filtrate per hour at a lower unit cost. Sludge and other suspended matter (down to 1/10 micron) are removed when the

bath or solution is pumped through permanent membranes caked with a few cents worth of filter-aid (diatomaceous earth).

To clean, you simply turn a few valves and reverse the flow. Air bump backwash shocks the caked filter-aid from the membranes and through the sludge drain. Maintenance costs are reduced to 1/2 that of ordinary industrial filters since there is no messy replacement of bags, sheets or pads, no manual cleaning labor, no dismantling.

Standard models are available in capacities from 500 GPH up, filter areas from 3 to 100 square feet.

We design and build specials to suit your requirements. Write for detailed information and filtering questionnaire.

*Wagner*

**BROTHERS, INC.**

**520 MIDLAND AVENUE • DETROIT 3, MICHIGAN**

CHICAGO • ROCHESTER • CLEVELAND • CINCINNATI • INDIANAPOLIS • ST. LOUIS • NEW YORK

When inquiring check CP 7881 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

**LPG storage tanks insulated against fire by lightweight concrete-type material . . .**

withstands heat to 1800°F, but keeps steel within safe temperature range

**Uses:** For insulating LPG (liquefied petroleum gas) tanks against fire. Also for use in various parts of industrial heating furnaces subject to temperatures up to 2000°F.

**Features:** Test panels made of steel plates encased in the insulating material, and of same construction as applied to LPG tanks, were subjected in a furnace to temperature of 1800°F for a period of two hours, to simulate external heat that might be encountered during a fire. During this time temperature of steel plates (under insulation) did not exceed 400°F; 800°F is considered to be safe limit for the shell of an LPG tank under emergency of fire exposure.

While still at a temperature of nearly 1800°F, insulated sides of panel were subjected to impact, erosion, and shock effects of a hose stream, similar to force of cold water which might be applied by fire hose to a tank overheated by fire. Insulation is said to have withstood all effects of this treatment.

**Description:** Fireproofing material, designated K-20 Concrete Mix, is a lightweight insulating concrete consisting of a kaolin base and a hydraulic setting cement binder. It is applied with a cement gun to a thickness of 1 1/2" on outside of tank, and is supported by steel bar banding straps fastened against tank casing by band tighteners. To these straps are fastened bent clips which, in turn, anchor insulation and serve as a spacer for 2" galvanized steel wire mesh reinforcement. For adequate anchorage, straps are located two feet apart and have clips every 12" along them.

Previous to application of K-20, tank shell is covered with corrosion-resistant paint. Because of refrigeration effect produced in some types of tanks by conversion of liquid to gas when tank is being discharged, it is possible for water vapor in atmosphere to condense on outer surface of tank. If tank is insulated, water and ice may form under insulation and cause oxidation of shell. Application of corrosion-resistant paint is to prevent such a development.

(Insulating material is a product of Refractories Div., The Babcock & Wilcox Co., Dept. CP, 161 E. 42nd St., New York 17, N. Y. . . or for more information check CP 7881A, pages 2 and 3.)

**Heavy duty burners offered in wide fuel range**

Type MU combination gas and oil burners and Type S vertically or horizontally fired premix gas burners for process furnaces are described in 4-page bulletin.

Bul 703-A is available from Peabody Engineering Corp., Dept. CP, 580 Fifth Ave., New York 36, N. Y. When inquiring specify CP 7882 on handy form, pages 2 and 3.

# AGILENE (POLYETHYLENE) AGILIDE (NON-PLASTICIZED) (POLYVINYL CHLORIDE)

## "Barriers AGAINST CORROSION"

### PLASTIC FABRICATIONS FOR THE CHEMICAL HANDLING INDUSTRIES

#### MODERN MATERIALS OF CONSTRUCTION



Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE—fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



Tried and successfully proven... Flexible couplings to connect AGILENE ducting for exhausting highly corrosive fumes. This is one of many unique Agile type fabrications that will reduce maintenance costs and meet your specific processing needs.

### American Agile Corporation

Plant and General Offices • 5461 Dunham Rd., Maple Heights, Ohio  
Mailing Address, P. O. Box 168 • Bedford, Ohio

DEPT C-1

#### MAINTENANCE

#### Combine motor mount with safety guard on unit heater

Company has announced improvement in construction on certain sizes of its horizontal discharge heater and suspended, vertical discharge heater. Feature of construction lies in combining motor mount with an integral safety guard. Result is a more rigid motor mounting and more strength in safety guard.



Horizontal discharge heater

(Utility unit heater and revolving unit heater are products of L. J. Wing Mfg. Co., Dept. CP, 179 Vreeland Mills Rd., Linden, N. J. . . . or for more information check CP 7884, pages 2 and 3.)

#### Floating, dynamic seal manually adjustable and totally inert

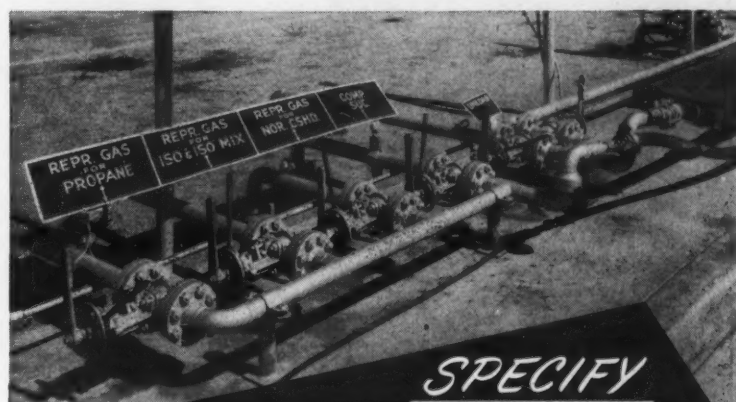
Uses: As a mechanical pump seal.

Features: Seal features ceramic and fluorocarbon components only, is chemically inert and manually adjustable for all viscosities and pressures to 100 psi. It is floating and dynamic, in contrast to pre-loaded fixture pressure seals or cartridge seal assemblies.

Description: Adjustment is made by means of regular stuffing box gland nut, much in the same manner as conventional fiber packings are tightened.

(MS Inert mechanical pump seal is a product of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark, N.J. . . . or for more information check CP 7885 on handy form, pages 2 and 3.)

for dependable, trouble-free control  
"of hard-to-hold" fluids . . . .



## SPECIFY HOMESTEAD Lever-Seald VALVES

they provide sure shut-off . . .

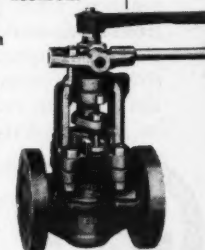
#### ARE STICK PROOF . . . OPERATE INSTANTLY

A positive, drop-tight seal and instant, stick-proof operation under all fluid, temperature or pressure conditions, is assured by the exclusive, built-in, Homestead Lever-Seald mechanism. This powerful lever-and-screw device not only presses the valve's tapered plug firmly into its seat to form a drop-tight seal, but also provides a positive means of relieving seating pressure just enough to overcome friction and permit easy operation. And because all operating parts and valve seating surfaces are fully protected in both the open and closed positions from the corrosive or erosive effects of line fluids, long, dependable, trouble-free service is doubly assured.

If "hard-to-handle" fluids are your problem, specify Homestead Lever-Seald Valves for your next installation or as replacements. You'll be glad you did.

We make them in metals and alloys to specification in sizes 1½" to 12", for pressures from vacuum to 1500 lbs., and for temperatures from 40° below zero to 1100°F. Dry seat, or pressure gun lubricated optional.

For complete details and copy of VALVE REFERENCE BOOK No. 39-3, MAIL THE COUPON TODAY.



Without obligation, send me Catalog 39-3 covering Homestead Lever-Seald Valves.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_ TITLE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

## HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 140

Cornopolis, Pa.

When inquiring check CP 7886 on handy form, pgs. 2-3

When inquiring check CP 7883 on handy form, pgs. 2-3





## BE SURE ABOUT THE "BIG 4" when you select Vacuum Pumps

To a large extent, these 4 basic values delivered by Roots-Connersville Vacuum Pumps account for the continuing upsurge in R-C installations. We can show you figures from users that prove the economies in first cost, and in power and water consumption, because of high speed (600 rpm or more) direct-connected drives.

Similarly, the records show remarkable freedom from maintenance, with resultant cost reduction and, more important, freedom from down time that can cause serious losses of production. These advantages accrue whether the installation consists of single or compound units—and regardless of capacity. Naturally, the larger the units, the greater the savings, both dollar-wise and percentage-wise.

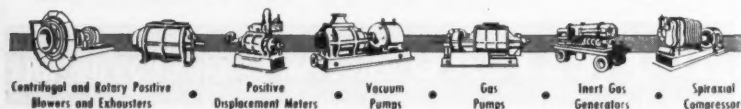
We suggest that if you are considering vacuum pumps for new installations or replacements, you check with R-C engineers to see how you can reduce your costs without sacrificing any element of long-time, reliable performance. Or, ask for Bulletin 50-B-13 which gives detailed descriptions.



### ROOTS-CONNSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.  
454 Richland Ave. • Connersville, Indiana

Reg. U.S. Pat. Off.



When inquiring check CP 7887 on handy form, pgs. 2-3

## MAINTENANCE

### Ease of coupling offered by V-belt construction

**Uses:** For compressors, pumps, blowers, fans, hammer mills, and other applications.

**Features:** Construction is said to give greater strength and durability at all key points, yet enable belts to be coupled or uncoupled easily.

**Description:** Veelos TD and TE link V-belts are made of plies of treated high tensile strength canvas duck, joined by riveted studs with removable cup washers and T-screws. Two types are available: regular rubber-coated for general services and oil-proof for oily and high temperature drives.

(V-belts are a product of Manheim Mfg. & Belting Co., Dept. CP, 13 Stiegel St., Manheim, Pa. . . . or for more information check CP 7888 on handy form, pages two and three.)

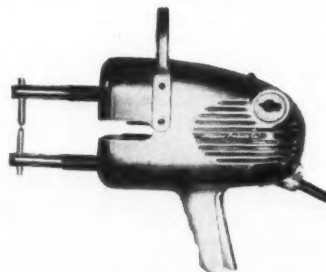
### Electronic timing control enclosed in portable spot welder . . .

has timing cycle of 1/60th to one second

**Uses:** For spot welding of most alloys of aluminum sheets and steel, mild or stainless, galvanized or cadmium plated.

**Features:** Welder has electronic timing control enclosed within unit. This offers a timing cycle from 1/60th to one second.

**Description:** Portable unit, Model 5201 (220-240 v, 60 c AC), has output of over 10 kva. Pistol grip assures easy operation and handling. Consistently uniform welds are given as fast as operator can squeeze and release handle.



Weights only 26 lb

### Precision Laboratory Measurement of

- Small quantities of gas or air flow
- Replacement for sight feed bubblers

### DWYER SERIES 490 FLOWMETER



**Accuracy**—Readings are on-the-line—not approximations.

**Easy to read**—Light enters from all sides of the solid acrylic transparent body for easy reading. Tapered indicating tube precision drilled, reamed and polished.

**Control Valve**—Built-in.

**Scales**—Standard 0-2, 0-4 or 0-10 CFH. Air, 0-100 CC/Min. Water. Special ranges available in production quantities.

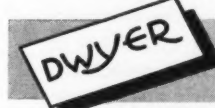
**Models**—Single or multiple units, surface mounting type.

**Mounting Holes**—To specification.

**Fittings**—1/8" SPT connections provided.

**Dimensions**—4" high x 1" square.

Ask for complete information.



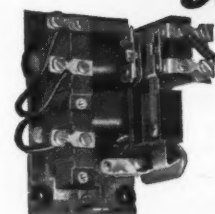
### Specialized INSTRUMENTS AND GAGES

F. W. DWYER MFG. CO. • 335 SO. WESTERN AVE. • CHICAGO 12, ILLINOIS

When inquiring check CP 7889 on handy form, pgs. 2-3



### all Electric FLOATLESS LIQUID LEVEL CONTROLS



The original — pioneered by B/W in 1933. No floats! No vacuum tubes! No moving parts in liquid. Literature describes relays and switches, automatic starter and relay combinations, multiple pump controls, special controls and panels and many application diagrams. Controls not affected by pressures, temperatures, acids or caustics. Remote control if desired. Ice free electrodes were necessary.

WRITE FOR CATALOG

### B/W CONTROLLER CORPORATION

2204 E. Maple Road, Birmingham, Mich.

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 7890 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Also available  
welder  
and put  
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APRIL,

## MAINTENANCE

Also available is a stand into which welder can be quickly mounted and put into use as a foot-operated floor model suitable for semi-production work.

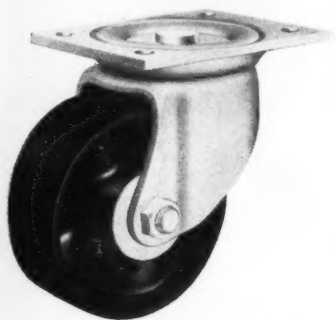
(Portable spot welder is a product of Ampower Products Co., Dept. CP, 5737 W. 87th St., Oak Lawn, Ill. . . . or for more information check CP 7891, pages 2 and 3.)

### Loads to 1500 lb shouldered by steel caster

**Uses:** For powered assembly-line dollies, heavy trucks, and similar mobile equipment.

**Features:** Caster has load rating of up to 1500 lb.

**Description:** Form-Forged cast-iron has double ball-bearing race for quiet, easy swiveling. Raceways are fully case-hardened for longer life, and kingpin is extra-heavy to pro-



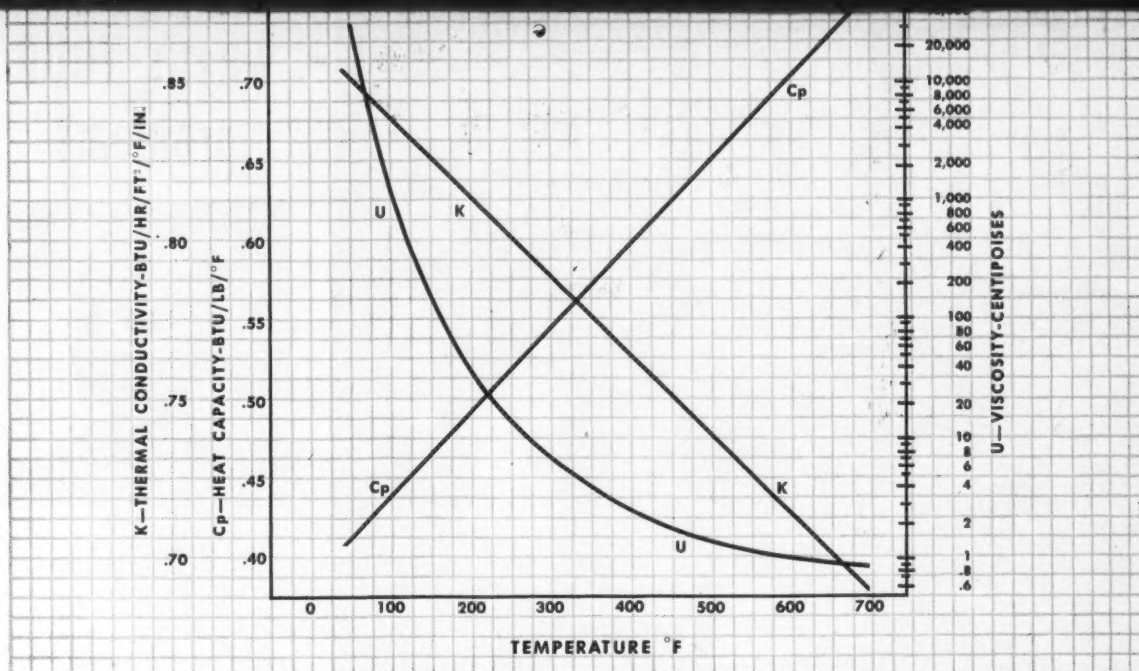
Available in swivel or rigid types

vide a high safety factor at this critical point. Caster is structurally shaped of heavy-gage steel to stand up under heavy loads in rough service.

Available in 5, 6, 8, and 10" sizes, with semi-steel, forged steel, or rubber-tread wheels. Caster can be ordered in swivel or rigid types.

(Steel caster is a product of The Bassick Co., Dept. CP, Howard Ave., Bridgeport 2, Conn. . . . or for more information check CP 7892 on handy form, pages 2 & 3.)

For more information on product at right, specify CP 7893 . . . see information request blank between pages 2 - 3.



Thermal properties of Circo XXX Heavy Heat Transfer Oil are indicated as follows: thermal conductivity (K); heat capacity (Cp); viscosity (U).

# WHY IS CIRCO XXX HEAVY AN EXCELLENT HEAT TRANSFER MEDIUM for temperatures as high as 600 F?

## because:

- 1 Its high thermal conductivity assures fast, efficient heat transfer to the process material
- 2 Its high heat-carrying capacity assures maximum efficiency over its entire operating temperature range
- 3 It doesn't form hard carbon deposits, which reduce heat transfer efficiency
- 4 Its low vapor pressure and high initial boiling point prevent pressure buildup
- 5 Its viscosity is low enough to permit easy circulation with any pump used in an oil-type heat transfer system

### Other important properties of Circo XXX Heavy Heat Transfer Oil

Viscosity, SUS at 210 F . . . 145-155  
Gravity, Specific . . . 0.94-0.96  
Acidity . . . neutral  
Carbon residue . . . 0.5 max  
Demulsibility . . . good  
Initial boiling point . . approx 860 F  
Vapor pressure at 600 F . . . nil

For more information about heat transfer oils and systems, send for "Circo Heat Transfer Oils." Write SUN OIL COMPANY, Philadelphia 3, Pa., Department CP-4.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY



PHILADELPHIA 3, PA. ♦ SUN OIL COMPANY LTD., TORONTO & MONTREAL





Despite cleanliness and efficiency of a midwest firm's Plastic Division, shown above, there was "dirty work" afoot in the hydraulic systems of the injection molding machines. Division superintendent (left) and A. L. Seabaugh, of Standard Oil, came up with a solution.

## Stops "dirty work" in hydraulic units

● A midwest company became increasingly aware that hydraulic oil performance in its fourteen injection molding machines was not all that it should be. Formation of oil deposits not only made frequent cleaning of filters necessary but posed a threat to efficient operation of the hydraulic units.

A Standard Oil lubrication specialist recommended STANOIL Industrial Oil, a top quality product of exceptionally high stability and containing necessary additives to prevent corrosion and oxidation troubles.

Throughout six years of continuous hard use, STANOIL has provided clean



operation. It has not been necessary to replace any of the original fills of STANOIL, and only a small amount of make-up oil has been needed. Where filters previously had to be cleaned at least four times a year, they are now cleaned once each year. Hydraulic operation has been efficient and reliable.

You can rely on STANOIL to give you the same clean, dependable service not only in hydraulic units but in a wide variety of equipment. You can get the help of the Standard Oil lubrication specialist serving your section of the Midwest by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

## What's YOUR problem?



A. L. Seabaugh, working out of Standard's Chicago office, is the lubrication specialist who helped this midwest firm gain both operating and maintenance benefits through use of STANOIL in hydraulic units.

Located throughout the Midwest is a corps of specially trained, experienced Standard Oil lubrication specialists, ready to give you prompt, on-the-spot help with lubrication in your plant. Their broad background of practical experience, plus their thorough training in Standard Oil Lubrication Engineering Schools, is yours for the asking. Simply phone your nearest Standard Oil Company office. The lubrication specialist will call without delay. He has a complete line of petroleum products to offer, including such outstanding lubricants as:

**SUPERLA Greases** — Available in a wide range of consistency grades and in both lime-soap and soda-soap types. SUPERLA Greases cover a wide range of operations. These efficient products are comparable in quality with the highest type of special greases.

**STANOLITH Greases** — Because these unique lithium soap products possess the heat resistant properties of soda-soap greases and the water resistant properties of lime-soap greases, they offer a solution to lubrication problems caused by the presence of both heat and water.



**STANDARD OIL COMPANY**

(Indiana)

## MAINTENANCE

**Media injurious to brass and bronze handled by solenoid valve . . .**

available in sizes from 1/2 to 2" with Teflon discs

**Uses:** For handling all media normally injurious to bronze or brass, but not harmful to ferrous metals.

**Features:** Engineering features include stick-free internal design, stainless steel hooded pilot seat screw for more positive closing action, and Teflon discs inert to all media except hot fluorine.



Valve has Teflon discs

**Description:** Series 4000 valves are available in sizes from 1/2 to 2". Pressures range to 1000 psi at 200°F and 500 psi at 450°F. Removable inserts are used throughout complete range of sizes. Neoprene O-rings seal joints and prevent leakage.

(Valves are a product of Dept. 136, Atkomatic Valve Co., Dept. CP, 545 Abbott St., Indianapolis 25, Ind. . . . or for more information check CP 7894 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 7895 . . . see information request blank between pages 2 - 3.

Radial on 28-1 have lo

A radial OD is us of each at Dow ing station supports speed, ra terms of 000 hr o



One of

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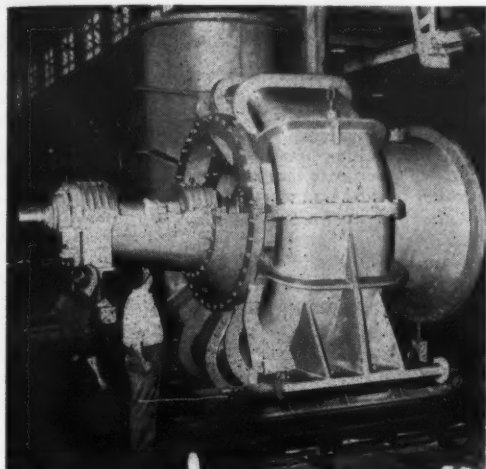
Offers c on spray

Compr illustra special data an Dimen are also Catalog Inform lated e check v

Cat 24 Dept. Specify

### Radial roller bearings on 28-ton pump have long life

A radial roller bearing with approximately 17½" OD is used as the inboard bearing on impeller shaft of each of two 28-ton, 60-inch water pumps in service at Dow Chemical's Freeport, Texas, reservoir pumping stations. Each bearing revolves at 257 rpm and supports a load of 17,750 lb. However, at that speed, rated load capacity is 170,275 lb, which in terms of bearing rating means approximately 3,000,000 hr of life, according to manufacturer.



One of two 28-ton pumps having radial roller bearings on impeller shaft

Type MUC 5248 bearing has a channel outer race which retains and guides roller assembly, and has a completely separable inner race. It is reported to be especially practical in installations that require frequent removal of shaft, leaving outer race and roller assembly in housing.

(Information on bearings courtesy of Rollway Bearing Co., Dept. CP, Seymour St., Syracuse, N. Y. . . . or check CP 7896 on handy form, pages 2 and 3.)

### Offers complete information on spraying system nozzles

Comprehensive reference catalog of 48 pages illustrates and describes thousands of standard and special industrial spray nozzles. For each nozzle, data are listed covering capacity and spray angle. Dimensional specifications for all standard nozzles are also given.

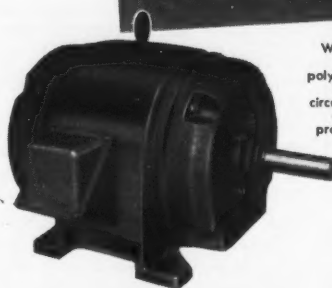
Catalog is indexed in terms of "spray patterns". Information is also supplied on a variety of related equipment, such as line strainers, elbows, check valves, and adjustable joints.

Cat 24 is available from Spraying Systems Co., Dept. CP, 3201 Randolph St., Bellwood, Ill. Specify CP 7897 on handy form, pages 2 & 3.

**Wagner**  
ELECTRIC MOTORS  
... the choice of leaders  
in industry

You can depend on Wagner Motors  
to furnish *PLENTY OF POWER*  
for compressors, pumps or blowers

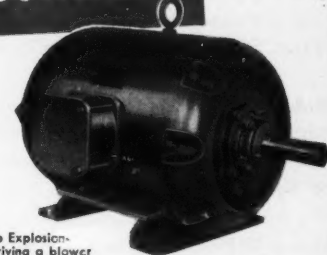
### PUMPS



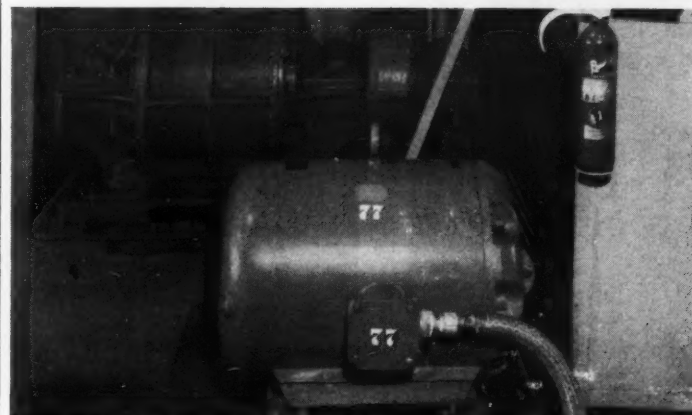
Wagner 15 hp  
Splash-proof  
polyphase motors  
driving water  
circulating pumps  
at a large oil  
processing plant  
in Louisiana.



### BLOWERS



Wagner 40 hp Explosion-proof motor driving a blower to draw grain into a hopper at a Southern brewery.



Motors that drive compressors, pumps and blowers need plenty of electrical and mechanical stamina to hold up under the hard, steady grind demanded by these applications.

Selecting the right motor for such equipment is not a problem of procuring specially built motors, but of choosing a standard Wagner Motor suited to the job. Wagner Motors are diversified in design and can be readily adapted to a wide range

of compressor, pump and blower applications. Improve the performance of your equipment by choosing Wagner Motors to power your compressors, pumps and blowers.

Bulletin MU-185 gives information on the complete line. Let a skilled Wagner engineer discuss your motor needs with you. Just call the nearest of our 32 branch offices, or write us.



WAGNER ELECTRIC CORPORATION  
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS  
TRANSFORMERS  
INDUSTRIAL BRAKES  
AUTOMOTIVE  
BRAKE SYSTEMS—  
AIR AND HYDRAULIC

When inquiring check CP 7898 on handy form, pgs. 2-3



# Custom Built at competitive cost of standard equipment

## M & L Heat Exchange Equipment offers all the advantages of "STANDARDIZED FLEXIBILITY"

—the advantages of fitting the equipment to your specific needs—custom built from standard basic elements. Saves time, cost and design drudgery.

**M & L DEPENDABILITY**—Thousands of successful heat exchange installations attest to the dependability of our "Standardized Flexibility".

**M & L ENGINEERING SKILL** compasses visual imagination, common sense and a full interpretation of your needs. Results are clearly, logically, quickly accomplished.

**M & L EXPERIENCE**, in stacks of case histories, and similarities of needs, leads to a quick, satisfactory determination of the type, size and construction of required equipment.

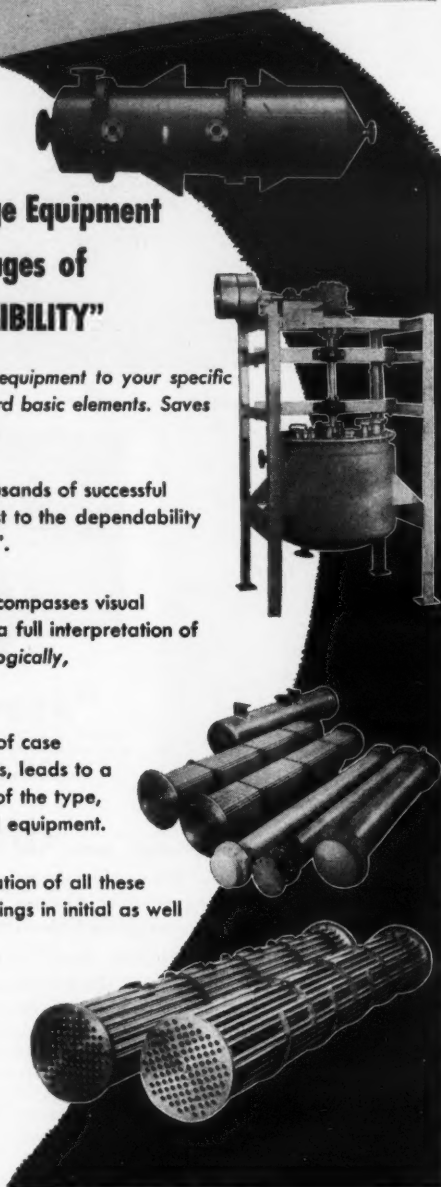
**M & L ECONOMY**—A combination of all these advantages adds up to real savings in initial as well as operational costs.

**You can rely on  
M & L EQUIPMENT**

*Inquires are invited.*  
There's a bulletin for every chemical processing and heat exchange equipment need.

**Manning & Lewis**  
Engineering Company

30 Ogden Street Newark 4, New Jersey  
SALES REPRESENTATIVES IN PRINCIPAL CITIES



When inquiring check CP 7899 on handy form, pgs. 2-3

## MAINTENANCE

### Trouble-free mechanism dispenses cleanser for hands . . .

disposable container holds  
1000 to 1500 washings

**Uses:** For dispensing waterless skin cleansers.

**Features:** With a minimum of parts, continuously lubricated by the cleanser itself, dispenser is said to provide trouble-free usage. Two-way feed adjustment provides a choice of amount dispensed. Unit is constructed of heavy aluminum, with rigid mounting bracket an integral part of dispenser.

**Description:** Type C dispenser is designed so it can be securely bolted for easy mounting on a wall or any other surface. Special "Throw-away" container is easily filled — entire container is simply lifted off and a new one slipped into dispenser housing. Each container provides 1000 to 1500 washings.



Spout does not drip

Designed with no sharp corners or crevices, unit wipes clean quickly. A "dip-stick" is provided for positive measurement of cleanser in container.

(Dispenser for hand cleanser is a product of Sugar Beet Products Co., Dept. CP, Saginaw, Mich. Check CP 7900, pages 2 & 3.)

*Handles  
any job  
requiring  
a baked  
finish*



## Despatch FINISH BAKING OVENS



Write for  
the Despatch  
RS Bulletin

All industrial painters are enthusiastic about the Despatch RS-4 or 5 Finish Baking Ovens. In this particular operation at Minneapolis-Honeywell Regulator Co. it is being used for baking finishes on relay cases. They like the accurate temperature control, ease of loading and temperature uniformity within their oven. They figure that this RS Oven, installed in 1946, paid for itself years ago through the saving in baking time and labor. Have you a need for controlled, uniform heat up to 500°?

**DESPATCH**  
Established 1902

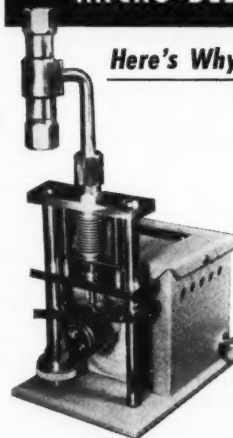
Manufacturers of ovens for: Paint Finishing . . . Dehydrating . . . Curing . . . Industrial and Lab. Applications.

343 Despatch Bldg., Minneapolis 14, Minn.

When inquiring check CP 7901 on handy form, pgs. 2-3

## The Perfect Pump for Chemical Laboratories . . .

### CORSON-CERVENY MICRO-BELLOWS PUMP



#### Here's Why!

- All parts in contact with pumped liquid are stainless steel.
- Cone-to-taper fittings prevent materials handled from contamination by the pump.
- Adaptable to many highly specialized uses. It can be equipped to facilitate handling of high melting materials, to pump low boiling materials, to handle gaseous materials.
- It's compact—6" x 3 1/2" x 10 3/4"; weighs 5.6 lbs. Made in three sizes for pump rates of 15 to 1000 ml. per hour; 30 to 2000 ml. per hour; and 30 to 7000 ml. per hour. Also available in "Teflon."

We have a booklet that gives all construction, operation and application details of the Corson-Cerveny Micro-Bellows Pump. Write for your copy.

## RESEARCH APPLIANCE COMPANY

Box 463, West View Road, Pittsburgh 9, Pa.

When inquiring check CP 7902 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Construct  
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Uses:

Features:  
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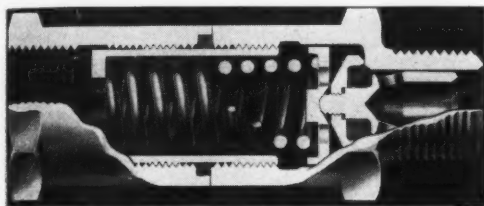
**Construction allows relief valve to be mounted and adjusted with ease . . .**

unit exhibits no leakage within 2% of preset cracking pressure

**Uses:** Suited to nearly all gas and liquid services.

**Features:** Compact, lightweight construction of in-line design is said to contribute to ease of mounting. Adjustment of cracking pressure within  $\pm 15\%$  of nominal can be made by using a standard Allen wrench to rotate threaded spring retainer. Interchangeable replacement springs can be used to provide a wider range of adjustment.

**Description:** Circle Seal 5100 Series relief valve is reported to provide excellent flow characteristics without complication of pilot operation. Performance curve shows a slight but regular increase in pressure drop with increasing flow rate, which serves to stabilize action and impart smooth, quiet, chatter-free operation.



Cutaway shows relief valve internal design

Use of an O-ring seal and a spring-centering device, which allows only axial force to be transmitted to poppet, is said to result in valve that combines sensitive operation with durability. Unit exhibits no leakage within as little as 2% of preset cracking pressure and reseats with no leakage within as close as 5% of setting, according to manufacturer.

Relief valve is available in either steel or brass for pressures from 50 to 1000 psi with male inlet and female outlet pipe threads. Sizes  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{8}$ ,  $\frac{3}{4}$ , and 1" can also be supplied in stainless steel with Teflon seal suitable for virtually any difficult service.

(Relief valve is a product of James-Pond-Clark, Dept. CP, 2181 E. Foothill Blvd., Pasadena 8, Calif. . . . or for more information check CP 7903 on handy form, pages 2 and 3.)

**Safety stressed in tool design**

Advantages of beryllium copper tools as a safeguard against fire and explosion are described in illustrated folder. Non-sparking and non-corrosive properties of 31 types of tools ranging from pliers and wrenches to wire brushes and nitro-cellulose forks make them desirable in chemical plants and for marine use.

Bul "Beryllium Copper Tools" is issued by Beryllium Corp., Dept. CP, Reading, Pa. When inquiring specify CP 7904 on handy form, pages two and three.

**In humid or wet surroundings...it pays to install trouble free**

# ALLEN-BRADLEY MOTOR CONTROL

In damp or wet surroundings protect men, motors, and equipment by specifying Allen-Bradley Starters.



Bulletin 709  
Automatic  
Starter

NEMA 4  
WATERTIGHT  
ENCLOSURES



Bulletin 609  
Manual Starter

Wherever conditions in your plant are humid or wet . . . it will pay you to install Allen-Bradley starters in watertight enclosures. Because of the simplicity of design and the consequent trouble free operation of the starter, inspection of these starters can be cut to the absolute minimum without sacri-

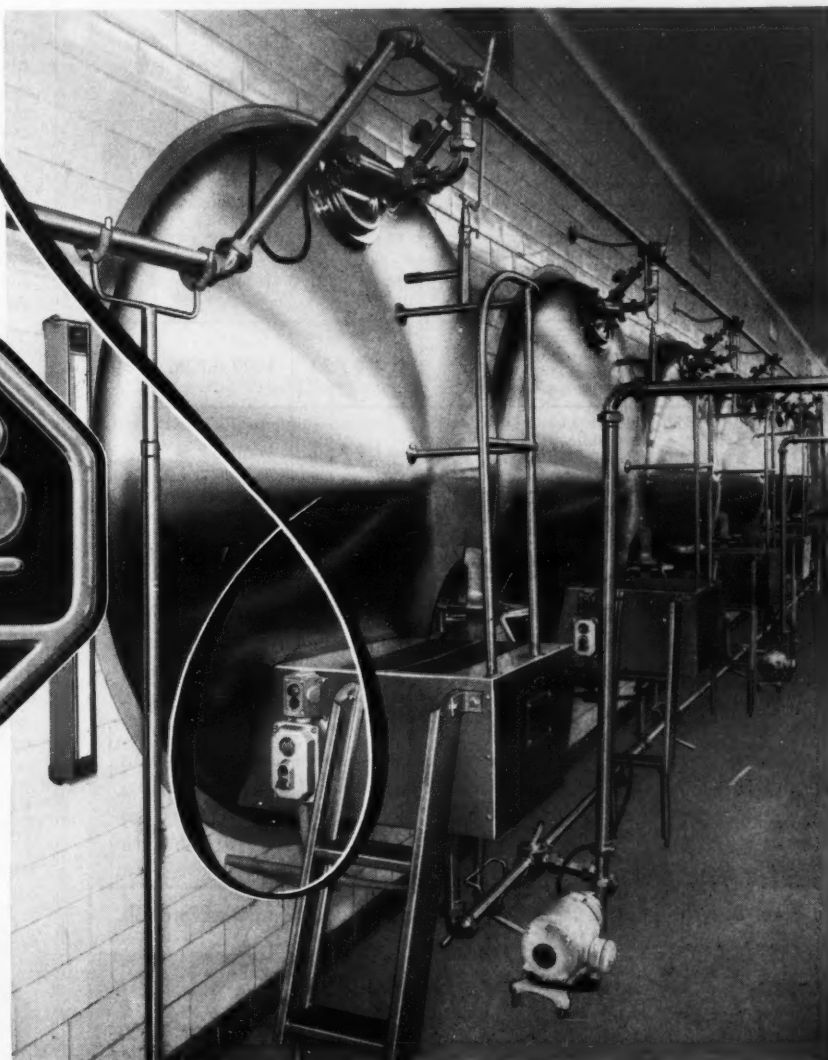
fice of reliable operation of the control. That means lower inspection and maintenance costs, while your plant engineers are left available for productive work.

Benefit from the experience of thousands of users of Allen-Bradley control—specify Allen-Bradley by name. You cannot go wrong.

Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wis.



*The Sign  
of Quality  
in  
Motor Control*



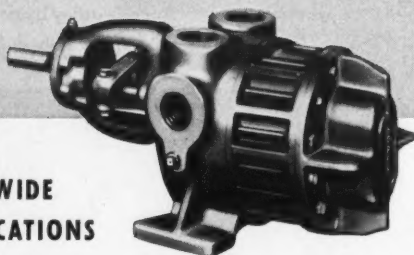
Close-up of the stainless steel storage tanks in the process room of the Rieck-McJunkin Dairy Co., Pittsburgh. Each tank has an Allen-Bradley Bulletin 609 Manual Starter in a NEMA 4 Watertight Enclosure.

When inquiring check CP 7905 on handy form, pgs. 2-3



# Install ROPER ROTARY PUMPS

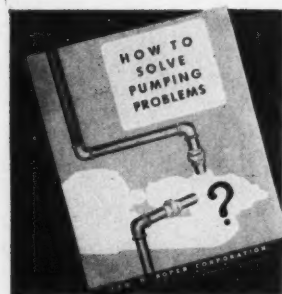
*for Positive Results*



MODELS FOR AN  
EXCEPTIONALLY WIDE  
RANGE OF APPLICATIONS

SERIES F  
PUMP

SERIES	TYPICAL USES	PRESSURES	SIZES
3600	All Petroleum Handling Grease Compounding Oil Circulating General Transfer	to 60 P.S.I.	40-300 G.P.M.
F	Pressure Lubrication Hydraulic Power Fuel Transfer Lube Oil Transfer	to 300 P.S.I.	1-300 G.P.M.
K	Pressure Lubrication Hydraulic Service Industrial Oil Burner Fuel Supply	to 150 P.S.I.	¼-50 G.P.M.
H	Hydraulic Power Test Equipment Pressure Lubrication High Pressure Coolant	to 1000 P.S.I.	5-75 G.P.M.



**NEW!** LATEST EDITION OF THIS  
BOOKLET NOW READY FOR  
YOU! SEND FOR YOUR FREE COPY

A valuable guide covering important fundamentals  
of estimating requirements of the average pumping  
job. It includes tables, charts, sample problems, and  
other pertinent data. SEND COUPON BELOW.

Geo. D. Roper Corporation, 744 Blackhawk Park Ave., Rockford, Ill.

Please Send Booklet—"How to Solve Pumping Problems"

NAME .....

ADDRESS .....

CITY ..... STATE .....

**ROPER**  
*Rotary Pumps*

When inquiring check CP 7906 on handy form, pgs. 2-3

## MAINTENANCE

**Compact 200 w lamp  
has physical size  
of 150 w unit**

**Uses:** Designed to replace manufacturer's standard 200 w PS-30 clear and inside-frosted lamps.

**Features:** This 200 w standard voltage incandescent lamp is the same physical size as usual 150 w PS-25 lamp. This smaller lamp lends itself to use in places where a larger bulb would not fit, thus making it possible to obtain increased illumination from luminaires previously limited by bulb size.

**Description:** Lamp uses a coiled-coil filament in which traditional single-coil filament is itself coiled.

Light maintenance in a coiled-coil filament is said to be inherently superior to that of single-coil filament. In this case it results in an average of 8 w greater power-to-light conversion throughout lamp's life—equivalent to an increase of 150 mean lumens.

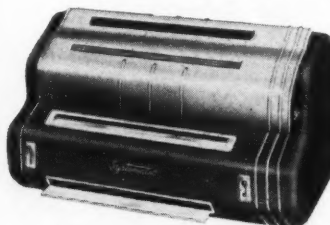
(Lamp is a product of Westinghouse Lamp Div., Westinghouse Electric Corp., Dept. CP, MacArthur Ave., Bloomfield, N. J. . . . or for more information check CP 7907, pages 2 and 3.)

**Copies in any color  
turned out at over  
100 per hr . . .**

automatic photocopy unit has  
many applications

**Uses:** For making photocopies of letters, documents, forms, etc, in any color.

**Features:** According to manufacturer, even an inexperienced operator can produce a minimum of 100 copies per hour. Unit is designed to handle letter and legal size copies as well as larger copies up to 11" in width, in any



No additional equipment used

## King MANOMETERS

Every Size — for Every Service

### U-Type Manometers

- Single Cleanout
- Single Gland-Packed
- Double Cleanout
- Double Gland-Packed
- High Pressure

Low in price  
Trouble-free  
Easy to install  
and read

### Well-Type Manometers

- Low Well
- Raised Well
- Barometric Reading

Stay clean  
longer  
Easy to service

### Multi-Tube Manometers

- Multi-Well
- Common-Well
- Special-Purpose

**FREE LITERATURE** gives sizes, construction and prices. Write today! And ask for informative 12-page Manual on Manometers.

KING ENGINEERING PRODUCTS include King-Gages — Manometers — Self-Closing Push Valves — Pressure Transmitters — Sight Feed Bubbles — Overflow Check Valves — Air-flow Strainers — Sediment Traps — Moisture Indicators



**KING ENGINEERING CORP.**

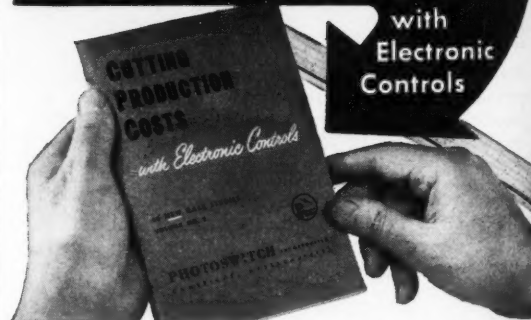
Box 270 • Ann Arbor, Mich.

REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 7908 on handy form, pgs. 2-3

## 46 tested ways to SAVE MONEY

with  
Electronic  
Controls



A completely revised edition of the handbook that has become the "bible" of electronic control for thousands of engineers and production executives.

Newly edited, with 46 new case studies showing how standard packaged electronic controls have solved many industrial problems you're likely to meet. It explains clearly and factually, without hocus-pocus, tested ideas for achieving new efficiency through "Electron-eered" counting, weighing, measuring, timing and cycling.

Send for your FREE copy now!



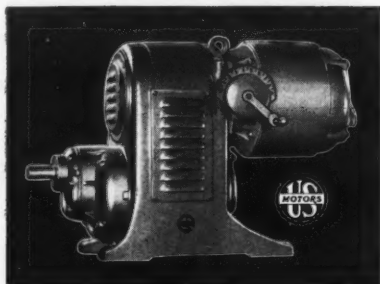
**Photoswitch Incorporated**

Dept. P6-4, 77 Broadway, Cambridge 42, Mass.

When inquiring check CP 7909 on handy form, pgs. 2-3

CHEMICAL PROCESSING

# THOUSANDS OF PLANTS NOW GETTING THOUSANDS OF SPEEDS



## Miracle Motor

ANY RPM BY DIAL CONTROL

Get more production out of your present machines by powering them with U.S. Varidrive motors. No extra space required. Thousands of plants are profiting with this miracle motor. Turning a simple control handle changes speed of the Varidrive to any desired r.p.m. in ratios up to 10:1. Operators can instantly select the speed best suited for the work.

### ALL-IN-ONE PACKAGE

Occupies little more space than a single speed motor.  $\frac{1}{4}$  to 50 hp, 2 to 10,000 r.p.m.

## U.S. VARIDRIVE

Mail Coupon for 16-pg. Booklet

REQUEST FOR VARIDRIVE BOOKLET

U.S. ELECTRICAL MOTORS Inc. CP-4  
Box 2058, Los Angeles 54, Calif. or Milford, Conn.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



When inquiring check CP 7910 on handy form, pgs. 2-3

APRIL, 1954

## MAINTENANCE

length. There is no limitation as to type of paper, documents, or originals that can be copied — regardless of whether original is printed on one or both sides or on opaque or translucent paper. Copies can be made in any color regardless of original color.

**Description:** With the Systematic Auto-Stat, no additional equipment is needed. Procedure is same as for regular black and white copies. No long drying period is involved — copies are made in less than a minute in two simple steps. The process is clean — eliminating chemical trays, running water, wet hands and fumes. Unit needs only to be plugged in and it is ready for operation.

(Photocopy machine is a product of The American Photocopy Equipment Co., Dept. CP, 2849 N. Clark St., Chicago 14, Ill. . . . or for more information check CP 7911 on handy Reader Service slip which is located between pages 2 and 3.)

**Vacuum,  $7 \times 10^{-6}$  mm(Hg)  
produced at 25°C with  
diffusion pump oil**

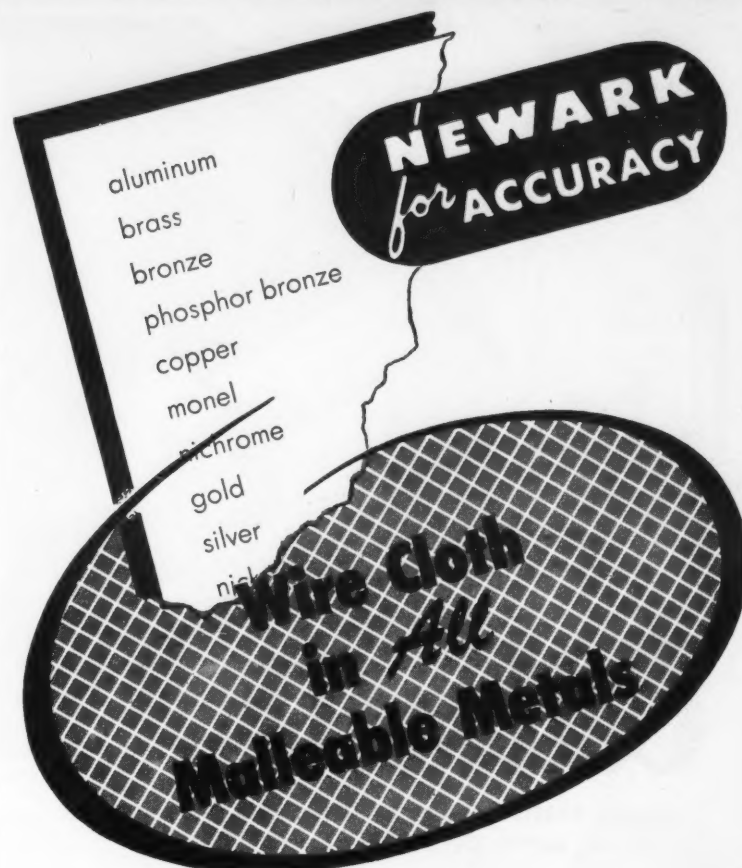
**Uses:** For use in diffusion and fractionating pumps.

**Features:** When used in a single stage, non-fractionating diffusion pump, oil produces a vacuum of the order of  $7 \times 10^{-6}$  mm (Hg) at 25°C without use of a liquid air or charcoal trap.

**Description:** Diffusion pump oil, called Cencoil-B, is a highly purified, distilled-in-glass, di-2-ethyl hexylphthalate. It is quite stable under conditions and permits operation at relatively high forepressures with low heat input.

Oil is said to be excellent for general purposes and especially suitable for use with manufacturer's Supravac Pump OD-25. Its boiling point at 0.5mm Hg is 180°C and its open flash point is about 380°F. Oil is available in 100 and 500 gm bottles.

(Diffusion pump oil is a product of Central Scientific Co., Dept. CP, 1700 Irving Park Blvd., Chicago 13, Ill. . . . or for more information check CP 7912 on the convenient Reader Service slip which is located between pages 2 and 3.)



Newark Wire Cloth is made of all malleable metals such as aluminum, brass, bronze, phosphor bronze, copper, monel, Nichrome, nickel and stainless steel; as well as the noble metals such as gold, silver, platinum, etc.

This wide range of metals enables you to select the one wire cloth to meet your conditions of corrosion and/or contamination.

In all metals, Newark Wire Cloth is accurately woven in a wide range of meshes, ranging from very coarse (4 inch space cloth), to extremely fine (up to 400 mesh). Our reputation for 'Accuracy' through more than 75 years is your guarantee of wire cloth quality.

We maintain a large stock of popular sizes in the more commonly used metals and can make prompt shipment. Let us quote on your requirements.

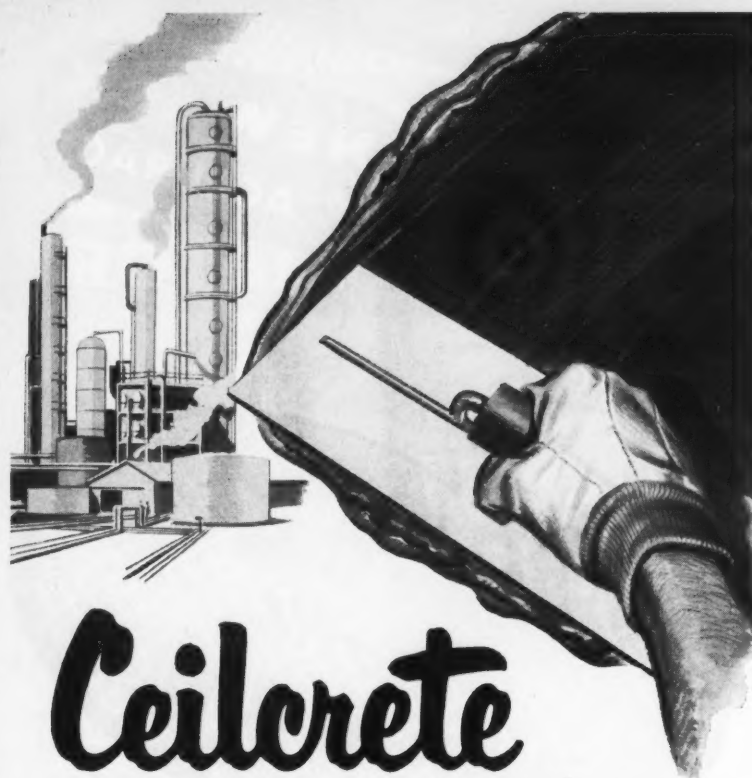
Send for our New Catalog E.

# Newark Wire Cloth COMPANY

351 VERONA AVENUE • NEWARK 4, NEW JERSEY

When inquiring check CP 7913 on handy form, pgs. 2-3





# Ceilcrete

a stonelike acidproof coating for floors, walls, tanks, trenches  
... provides superior protection for concrete surfaces

CEILCRETE is chemically equal to acidproof brick in many applications ... yet it can be applied at a fraction of the cost and in far less time! It can be troweled on all types of concrete surfaces: flooring ... pipe, tank and trench lining ... walls ... cement block ... pump bases ... waste disposal systems.

A thin coating of CEILCRETE withstands trucking, foot traffic and erosion from hot solutions and steam. Floors covered with CEILCRETE have load carrying capacity four times greater than plain concrete! Surface is nonslip, and CEILCRETE "B" has the added feature of being sparkproof.

Only CEILCRETE has maximum resistance to acids, alkalis and solvents as well as to abrasion and heat. It adds no weight to floors and does not noticeably raise the elevation.

CEILCRETE materials can be supplied ready for installation, or a complete job can be done on a contract basis. Available in black and colors.

For complete details  
and specifications, write  
today for Bulletin 110.



1859-CC



**THE CEILCOTE COMPANY**  
CORROSIONPROOF MATERIAL AND CONSTRUCTION

4834 RIDGE ROAD

CLEVELAND, OHIO

When inquiring check CP 7914 on handy form, pgs. 2-3

## MAINTENANCE

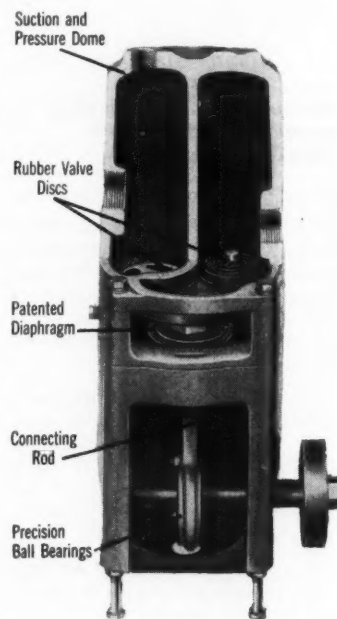
**Wearing parts eliminated  
by design features of  
diaphragm pump ...**

available in metals suited to  
materials being pumped

**Uses:** For pumping chemical and ceramic fluids, metallurgical slurries, filter feeds, filter aids, fluids with high crystalline content, food products, and pharmaceuticals.

**Features:** Pump eliminates wearing and sliding parts such as packing glands, piston leathers, cross-head assemblies, or revolving impellers. There is no contact between pumping mechanism and fluid handled, since chambers are separated by a rubber diaphragm.

**Description:** Working assembly consists of diaphragm, connecting rod, and crank shaft. Ball bearings are grease-packed and sealed at the factory. Construction is easy to disassemble quickly, without need for special tools.

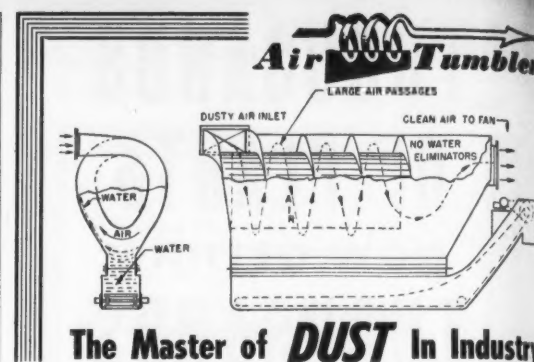


Disassembly is simple

Unit consists of pump, two-pole automatic pressure switch, motor and belt drive.

Capacities are 250, 350, and 450 gph for total suction lifts to 25 ft.

(Diaphragm pump is a product of W. S. Rockwell Co., Dept. CP, 200 Eliot St., Fairfield, Conn. ... check CP 7915, pages 2 & 3.)



## The Master of DUST In Industry

The soundness and simplicity of design, which so unmistakably distinguish the AIR TUMBLER from all other wet type dust collectors, assure not only very high efficiency of collection, but also dependable performance with a minimum of maintenance. Recirculation of the air is accomplished without causing condensation, because of the extremely low humidification of the air by the AIR TUMBLER.

Other advantages are: no fire hazard, low water consumption, low pressure drop, and low cost.

These advantages are recognized by the users, whose re-orders contributed over 80% to our 1953 sales.

Write for Bulletin No. 531 to:

## Dust Suppression and Engineering Co.

P. O. Box 67, Lake Orion, Michigan

Agents in the principal cities. Licensees in many foreign countries.

When inquiring check CP 7916 on handy form, pgs. 2-3

IS  
YOUR  
FILTER  
PROBLEM

baffling?

H<sub>2</sub>SO<sub>4</sub> Hydrogen Peroxide  
Fuming HNO<sub>3</sub> Molten Na or K  
Caustic Cl<sub>2</sub>

OR IS IT manageable?

Water Air Gasoline, etc.

MMC offers permanent filter media engineered for optimum efficiency in handling countless exposure conditions, some of which are mentioned above.

For further information request Bulletin 41 F

Another filtration engineering service of

**MICRO METALLIC CORPORATION**

GLEN COVE

PALL

NEW YORK

The Pall Filtration Companies

Micro Metallic  
Corporation

Porous Plastic  
Filter Co.

Aircraft Porous  
Media, Inc.

46-K Sea Cliff Ave.

Glen Cove, N. Y.

When inquiring check CP 7917 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Non-brittle cast iron is strong,  
can be bent and twisted  
without breaking . . .**

responds to thermal treatment in a manner similar to steel

**Uses:** For applications in the textile, chemical, and petroleum industries. In the glass industry, iron is being used for glass molds and plungers. Rubber industry makes use of metal for intricate tire molds. In the paper industry, it is being used for many maintenance parts, particularly gears and press rolls.

**Features:** Material is a non-brittle cast iron and can be bent or twisted. It has greater strength than conventional cast iron, as well as ductility and shock-resistance. In drop tests from a height of 20 feet, metal bounces off a steel plate without breaking.

**Description:** Ductile Iron is a magnesium-containing iron having spheroidal graphite in a broad range of matrix structures. It responds to thermal treatment in a manner similar to steel. Product represents a family of materials with tensile strengths varying from 60,000 psi to more than 200,000 psi and elongations ranging between 25 and 1%. It has a definite yield strength which is about 75% of tensile strength. Modulus of elasticity of material is about 25 million psi.

Fluidity of metal is high, providing excellent castability. It is being cast in green sand, dry sand, shell, and cement molds as well as in other special precision-mold materials. Castings ranging in weight from a few ounces to 50 tons have been produced. Other characteristics of the cast iron are good heat and oxidation resistance, mechanical wear resistance, pressure tightness, and excellent machinability. It can be satisfactorily flame or induction-hardened to produce parts having a hard surface for maximum wear resistance with a tough interior. Ductile Iron is weldable, using technics which are applied to gray iron.

(Ductile cast iron is a product of The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N. Y. . . . check CP 7918, pages 2 and 3.)

**Removes tramp iron from floors  
before it causes trouble . . .**

sweeper contains permanent magnet, is handled and dumped easily

**Uses:** Picks up scrap ferrous metal on floors of plants and warehouses.

**Features:** Sweeper requires no upkeep or make-ready. Built-in retainer accumulates tramp iron. Dumping takes less than one minute.

**Description:** Cesco magnetic hand sweeper is powered by strong Alnico permanent magnets. Wheels have ball bearings, and come equipped with semi-pneumatic tires.

(Magnetic sweeper is a product of Dept. A37, Columbia Engineering Service Co., Dept. CP, 4025-37 Sebastopol Hwy, Santa Rosa, Calif. . . . or for more information check CP 7919, pages 2 and 3.)

**IN TIMES SQUARE OR TIMBUKTU  
WE ARE INTERESTED IN YOU...  
AND YOUR VACUUM PROBLEMS**



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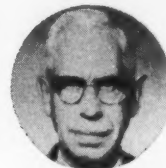
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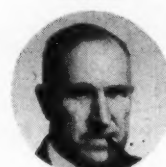
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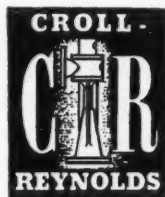
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During the 37 years our firm has been specializing in jet vacuum equipment, we have built up an exceptional organization of engineers who devote their full time to this important equipment. We have also acquired during this period a group of engineering representatives in twenty cities who handle our equipment in their respective territories. These men are all outstanding engineers. Each has average or better

engineering education and many years of experience including detailed experience on our jets and condensers. Incidentally, these jets are used for vacuum cooling, jet mixers, jet heaters, jet absorbers, fume scrubbers, thermo-compressors, etc. Please contact any of them or us when you want to take advantage of our long experience in this highly specialized field.



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Main Office: 751 Central Avenue, Westfield, N. J. New York Office: 17 John Street, N. Y. 38, N. Y.  
CHILL VACTORS • STEAM JET EVACTORS • CONDENSING EQUIPMENT

When inquiring check CP 7920 on handy form, pgs. 2-3



# GOULDS

## CENTRIFUGAL PUMPS

HORIZONTALLY SPLIT CASE • SINGLE STAGE • DOUBLE SUCTION

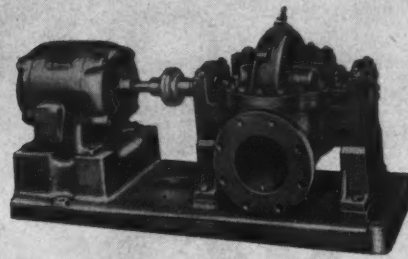


FIG. 3405

12 pages of facts about  
a NEW LINE of 19 pumps

The quickest way you can really discover what the new Goulds Fig. 3405 centrifugal pump can do for you is to read the descriptive bulletin pictured above.

Here are some hints of what you'll find:

The quality of materials and extras of design that you have been able to get only by paying extra are standard on this new pump: stuffing box bushings, stainless steel impeller keys, Teflon water seal rings — to mention a few.

The Fig. 3405 carries interchangeability of parts far beyond anything we've been able to do be-

fore. Only three shaft and rotating parts assemblies (exclusive of impellers and wearing rings) provide for 19 pump sizes.

This means real spare parts inventory savings for any plant that uses many pumps. It also means easy-to-make field changes to meet new requirements.

We've come as close as modern design and materials allow to putting into this new pump what our industrial customers have told us they want. The 12-page illustrated bulletin tells you all about it. We'll be glad to send you a copy.

To get a copy of Bulletin 721.6, get in touch with the nearest Goulds representative or just fill in the coupon, pin it to your letterhead and mail it to us at your convenience.



**GOULDS PUMPS, INC.**  
Dept. CP, Seneca Falls, N. Y.  
Please send me 12-page information Bulletin No. 721.6 on the new Fig. 3405 centrifugal pump.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 7921 on handy form, pgs. 2-3

### MAINTENANCE

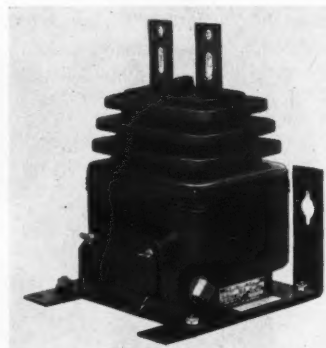
**Up to 5000v handled by compact outdoor transformer . . .**

butyl process applied to unit which is smaller, lighter

**Uses:** For outdoor applications up to 5000v.

**Features:** Smaller and lighter than previous models, transformer is said to represent the first successful application of the butyl process to higher-voltage outdoor transformers.

**Description:** Entire exposed surface of transformer is corrosion-resistant, and should reduce maintenance to a minimum.



Exposed surface of transformer is corrosion-resistant

Possible bushing breakage has been reduced by use of butyl instead of porcelain as construction material. Necessity for gaskets or welding is eliminated since bushing and case form a homogeneous whole.

Small size and lighter weight of transformer facilitate mounting in any feasible position — vertical, inverted, or horizontal. Secondary terminal box is molded in case as an integral part of transformer, with butyl acting as a gasket. Aluminum cover provides water-tight protection.

Primary coils are of the "figure 8" design, for high mechanical strength. Low core losses and high accuracy result from interleaved, high-permeability silicon-strip steel core.

(Transformer is a product of General Electric Co., Dept. CP, 1 River Rd., Schenectady 5, N. Y. . . or for more information check CP 7922 on the convenient Reader Service slip which is located between pages two and three.)

## SPERRY HAS THE ANSWERS

—Whatever Your Filtration Problems May Be . . .

During a half century of designing filter presses for America's manufacturing companies, Sperry has solved nearly every known type of industrial filtration problem. Sperry Filter Presses are flexible in size and design . . . there is a complete range of filter bases . . . and a choice of six different closing devices.

Send for the Sperry Filter Press catalog and you'll see why Sperry can solve your filtration problems efficiently and economically.

### D. R. SPERRY & CO.

Batavia, Illinois

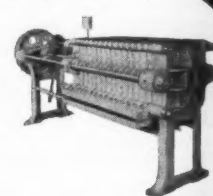
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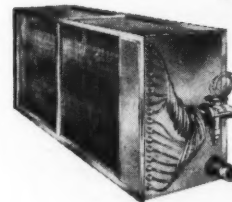
When inquiring check CP 7923 on handy form, pgs. 2-3

Industry Had  
Acid Vapor  
Heating and  
Cooling Problems

# REMPE

Solved Them With...

FIN AND PIPE COILS  
OF STAINLESS STEEL



Rempe Fin Type Coils are ideally suited for handling all types of corrosive air mixtures, gas or liquid, heating or cooling needs.

We have complete facilities and tested technique in the fabrication, welding and finishing of pipe coils made from all types of stainless steel.

Send details or blueprints for engineering advice and quotations on your requirements, for all types, all materials of pipe and fin coils.

## REMPE COMPANY

330 N. SACRAMENTO BLVD.

CHICAGO 12, ILL.

When inquiring check CP 7924 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Sump and adapted applications

basic been

Capacities to

information is located in

Temp range featured P-S tape

manuf

Uses: Temperatures of for tape and sticking surfaces electrical in

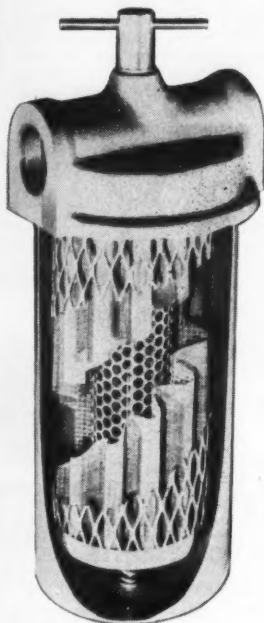
Features: a silicone over temper

Description: Temp-R-Tape faces include copper, and widths vary

(Pressure-sensitive Teflon, is a Dept. CP, for more information pages 2 and

### Sump and line filters adapted for water applications . . .

basic internal design and major features have been retained



Capacities range from 5 to 100 gpm

information check CP 7925 on handy form which is located between pages 2 and 3.)

### Temp range of $-80^{\circ}\text{F}$ to $400^{\circ}\text{F}$ featured by Teflon-base P-S tape . . .

manufactured in widths from  $\frac{1}{2}$  to 12"

**Uses:** For sealing ducts to be used at high temperatures or for handling chemicals. Additional uses for tape are as a facing material, providing a non-sticking surface for packaging machinery, and for electrical insulation.

**Features:** Manufacturer indicates that tape, using a silicone polymer adhesive, is completely effective over temperature range of  $-80^{\circ}\text{F}$  to  $400^{\circ}\text{F}$ .

**Description:** Pressure-sensitive tape, designated Temp-R-Tape T, adheres readily to a variety of surfaces including glass, aluminum, steel, phenolics, copper, and brass. It is being manufactured in widths varying from  $\frac{1}{2}$  to 12".

(Pressure-sensitive tape, with a base of DuPont's Teflon, is a product of Connecticut Hard Rubber Co., Dept. CP, 407 East St., New Haven 9, Conn. . . or for more information check CP 7926 on handy form, pages 2 and 3.)

**Uses:** For water filtering applications.

**Features:** Units are said to offer greater filter area and longer periods of operation. They have no moving parts and maintenance is simple. Basic synclinal design, as found on manufacturer's oil filters, has been retained.

**Description:** Filters are available for either sump or line installation in eight sizes from 5 to 100 gpm. Choice of mesh sizes ranging from coarse 30 to fine 200 will handle various size particles.

(Filters are products of Marvel Engineering Co., Dept. CP, 625 W. Jackson Blvd., Chicago 6, Ill. . . or for more



20 pages of useful information about PYREX brand "Double-Tough" Glass Pipe and Fittings.

## This new catalog describes the most practical means of fighting pipeline corrosion and contamination

The new PYREX brand "Double-Tough" Glass Pipe Catalog describes the basic properties that make PYREX pipe the solution to most acid-handling pipeline problems. It catalogs completely what's available in PYREX pipe and fittings.

You may find it convenient to have this new PYREX pipe catalog at hand. The distributor nearest you will be glad to send you a copy without further obligation on your part. If you do not know him, just fill out and mail the coupon direct to us at Corning.

### Cost-reducing improvements

The new catalog lists for the first time two pipe joint improvements that contribute substantially to lower installation and maintenance costs—a new molded insert and a new snap-on gasket.

The molded insert reduces any tendency toward leaky joints. The snap-on gasket, made of Teflon, will stand up to the severest acid corrosion service.

Together, the new insert and gasket reduce the assembly of PYREX pipe joints to a one-man job. Friction holds the insert in place on the pipe ends and tough brass clips correctly position the gasket between the pipe ends while the joint is pulled up tight. Both are described on page 12 of the catalog.

### Contents of new PYREX pipe catalog

Performance	Non-stock fittings
Corrosion resistance	Spacers for making length adjustments
Operating temperatures and pressures	Adjustable joints
Physical characteristics	Sink traps
How PYREX pipe is made	Stock valves
Economy	Joints
Cleaning	Flanges, gaskets, inserts
Installation	Adapters for connecting with other materials
Pipe specifications	Special fittings
Stock fittings	How to order



**CORNING GLASS WORKS**  
CORNING, NEW YORK

*Corning means research in Glass*

**CORNING GLASS WORKS**  
34 Crystal St., Corning, N. Y.

Please send me a copy of the new PYREX brand "Double-Tough" Glass Pipe Catalog.

Name ..... Title .....

Company .....

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When inquiring check CP 7927 on handy form, pgs. 2-3



## VALVE MAINTENANCE COSTS GETTING YOU DOWN?

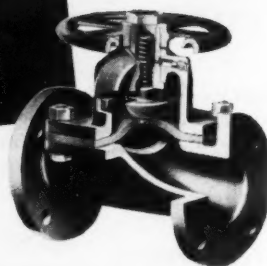


The problem was solved  
in this plant with  
**HILLS-McCANN**  
diaphragm valves

**IF YOU HANDLE CORROSIVE FLUIDS  
THEY'LL DO THE SAME FOR YOU**

The unique Saunders Patent design of Hills-McCanna Diaphragm Valves completely isolates the working parts of the valve from the flow. There is no packing to tighten or replace . . . no problem of leakage, internally or externally. You have a choice of body materials of any machinable alloy or linings of lead, glass, rubber, plastic, etc. Fifteen diaphragm materials are available including rubber, Neoprene and Teflon. There is also a wide choice of manual or remote operators. Sizes range from 3/8" through 14". May be used at pressures to 150 psi, temperatures to 350° F.

If you valve corrosive materials write today for descriptive folder. For specific recommendations send an outline of your requirements. **HILLS-McCANN CO.**, 2370 W. Nelson St., Chicago 18, Ill.



# HILLS-McCANN

*saunders patent diaphragm valves*

Also manufacturers of  
Chemical Proportioning Pumps • Force-Feed Lubricators  
Magnesium Alloy Sand Castings

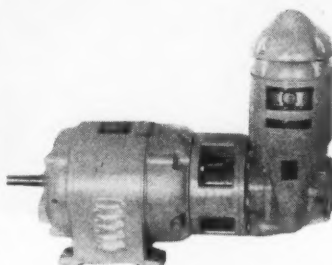
When inquiring check CP 7928 on handy form, pgs. 2-3

## MAINTENANCE

**Single mounting base for  
multimotor unit avoids  
alignment problems**

Packaged unit, consisting of a horizontal motor, a footless right angle worm gear motor, and an over-running clutch, has take-off speeds of 1750 and 100 rpm. Other combinations of speeds are available in ratios as great as 100:1.

Extremely silent in operation, this unit avoids many misalignment problems common to some multi-



Unit has take-off speeds of 1750  
and 100 rpm

motor applications by having but one mounting base. By means of a special bracket, right angle Syn-cro-gear is assembled to horizontal Uniclosed motor in factory, simplifying final installation of unit onto driven machine. Unit has many industrial applications.

(Product of U.S. Electrical Motors, Inc., Dept. CP, Box 2058, Terminal Annex, Los Angeles 54, Calif. . . . or for more information check CP 7929 on handy form, pages 2 and 3.)

**Automatic cutout stops  
overheating in blower  
motor . . .**

600 cu ft/min of air handled

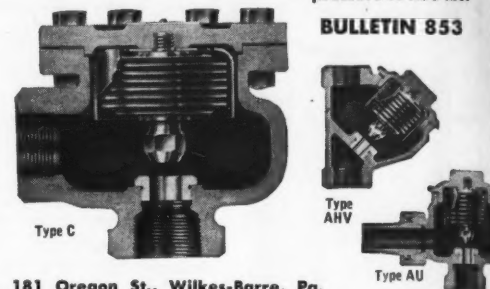
**Uses:** For removal of fumes, smoke and stale air or for cooling and ventilating.

**Features:** Blower has an automatic cutout which stops completely enclosed 110v, 60c motor before it can overheat.

**Description:** Large-capacity blower (6" wheel) is capable of moving up to 600 cu ft of air per min. Smaller sizes with different capacities and current characteristics are also available.

## Nicholson Steam Traps Test MAXIMUM CAPACITY PER \$ COST

One of the nation's largest plants recently conducted comparative tests of steam traps. They showed that Nicholson traps "provide lowest initial cost for handling large amounts of condensate." Other Nicholson features: operate on lowest temperature differential; only one moving part; freeze-proof. See why leading plants are increasingly standardizing on Nicholson for faster heat transfer. 5 types: size 1/4" to 2"; pressure to 250 lbs.



BULLETIN 853

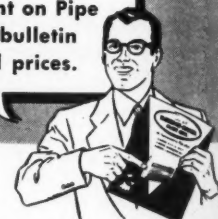
181 Oregon St., Wilkes-Barre, Pa.

**W. H. NICHOLSON & CO.**  
TRAPS • VALVES • FLOATS

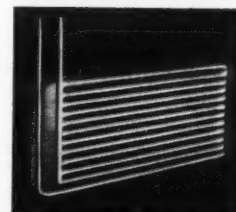
When inquiring check CP 7930 on handy form, pgs. 2-3

... what are  
**THERMO PANELS?**

An effective and economical improvement on Pipe Coil. This FREE bulletin gives facts and prices.



LOW IN FIRST COST . . . LIGHT  
WEIGHT . . . SPACE-SAVING.



• For use in the heating or cooling of liquids, slurries, soaps, waxes, acids, alkalis, electrolytes, powders, and mixtures. Provide efficient heat transfer . . . simple to install . . . easily replaced.

Available in special shapes such as "U"s, "L"s, and cylinders . . . and in a wide range of materials, including iron, stainless steel, Monel and other special alloys. Send for FREE bulletin

Manufacturers Representatives Wanted  
Choice territories now open. Write for details.

**THERMO-PANEL**  
DIVISION

DEAN PRODUCTS, INC. • 616 Franklin Avenue,  
Sterling 9-5400 Dept. CP Brooklyn 38, N. Y.

When inquiring check CP 7931 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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pgs. 2-3

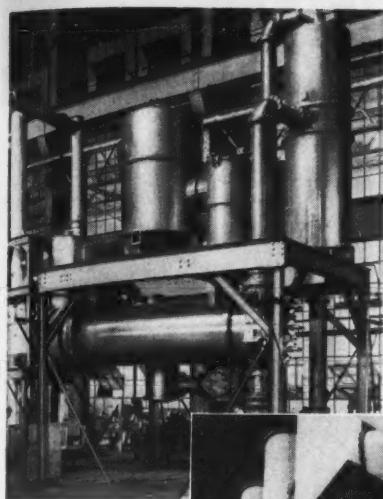
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Avenue,  
8, N.Y.

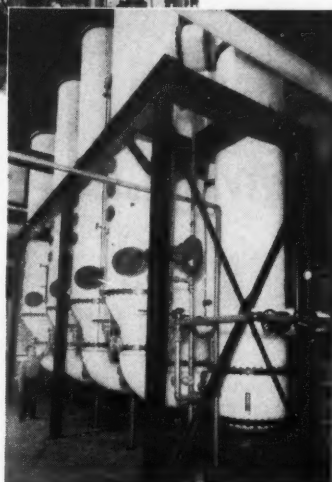
pgs. 2-3

SSING



This BUFLOVAK Forced Circulation and V.R.C. (Vertical Rapid Concentration) Evaporator produces a high quality citrus concentrate from a viscous product.

Buflovak Natural Circulation Type Evaporator. This Quadruple Effect used to concentrate a food product; automatically controlled.



## WHICH ONE?

### each evaporator problem has one best answer

If you have an evaporator problem it must be treated individually . . . if you want the most profitable return on your invested dollars.

BUFLOVAK Vertical Rapid Concentration Evaporators provide high rates of evaporation, maximum recovery of solids, with simple, easy operation. You can pre-test in the BUFLOVAK Testing Laboratory in order to be doubly sure. Your engineers and ours do the testing, or we do it for you.

BUFLOVAK V.R.C. Evaporators offer many operating advantages in concentrating liquids which do not precipitate crystals during concentration. Particularly, heat-sensitive materials, foamy liquids, and products requiring sanitary operation. Other types of BUFLOVAK Evaporators are available also, to serve every industry where liquids must be concentrated.

**BUFLOVAK EQUIPMENT DIVISION**  
OF BLAW-KNOX COMPANY  
1645 Fillmore Street, Buffalo 11, New York

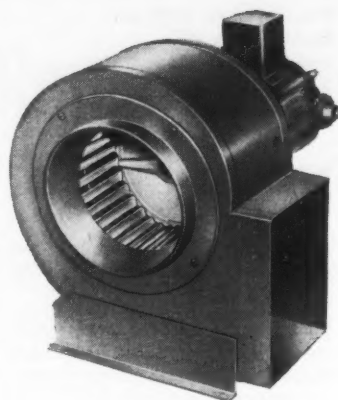


BUFLOVAK catalogs have a wealth of valuable information for you on drying, evaporation and processing. A request on your company letterhead will bring copies to you.

When inquiring check CP 7932 on handy form, pgs. 2-3

APRIL, 1954

## MAINTENANCE



Blower has 6" wheel

(Blower is a product of Standard Electric Mfg. Co., Inc., Dept. CP, West Berlin 12, N. J. . . or for more information check CP 7933 on handy form, pages 2 and 3.)

### Single package units control any heating application . . .

ten separate systems enable choice for requirements

**Uses:** For automatic control in furnace, oven, kiln or dryer applications.

**Features:** Ten separate packaged systems are offered, enabling selection of control system engineered to satisfy particular requirements.

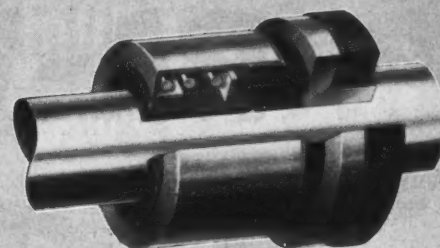
**Description:** Control packages are designed to operate on-off or proportional fuel valves of electric contacts, in a variety of control systems, including proportional, proportional-input, on-off, or time-program. Automatic reset is also available. They include all components necessary for complete installation, including a pyrometer, relay or controller, and a motor operator.

In addition, all necessary sensing elements, electric and air-operated control valves, combustion safeguards, panels and accessories are available in the single package installation.

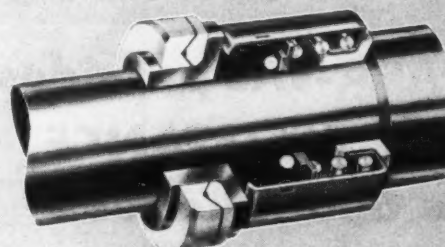
(Bristol-Beck heating control packages are a product of The Bristol Co., Dept. CP, 143 Bristol Rd., Waterbury, Conn. . . or for more information check CP 7934 on handy form which is located between pages 2 and 3.)

## Garlock "Package" Seals FOR ROTATING PUMP SHAFTS

Type BB-21A—Garlock Package Seal of standard construction with brass shell, brass washer, and Buna-N bellows.



	TYPE BB-21A	TYPE AA-21A
Liquids	For water, oils, alcohol, solvents (except aromatic, chlorinated and ketone types) and other liquids (except strong acids).	For very strong acids, oils, solvents (including aromatic, chlorinated and ketone types) and all other liquids.
Equipment	Rotating shafts of centrifugal pumps, process pumps, chemical pumps, agitators and similar applications.	
Sizes	For shafts from 3/8" to 3" diameters.	
Temperatures	With Buna-N bellows up to 212°; with silicone bellows up to 450° F.	Up to 450° F.
Pressures	Up to 150 p.s.i.	Up to 150 p.s.i.



Type AA-21A—Garlock Package Seal with hat-shaped "Teflon" drive ring, brass or 316 stainless steel shell and washer, "Teflon" "O" ring, and "Teflon" two-piece vibration ring.

### ✓ CHECK THESE IMPORTANT FEATURES

- ☐ Occupy very small space
- ☐ Completely assembled—ready to install
- ☐ Proven performance at low cost
- ☐ Both types are dimensionally interchangeable

In both of these Package Seals, a leakless seal is provided by a positive contact between carefully lapped metal-to-carbon mating surfaces. All metal parts in both types are available in plated-brass, Ni-Resist, stainless steel with malcomized face, Garlock "B" iron, and others.

For complete details, ask your Garlock representative or write us about your sealing problems.

THE GARLOCK PACKING COMPANY  
PALMYRA, NEW YORK

In Canada: The Garlock Packing Company of  
Canada Ltd., Toronto, Ont.

Branch Offices in Most Principal Cities



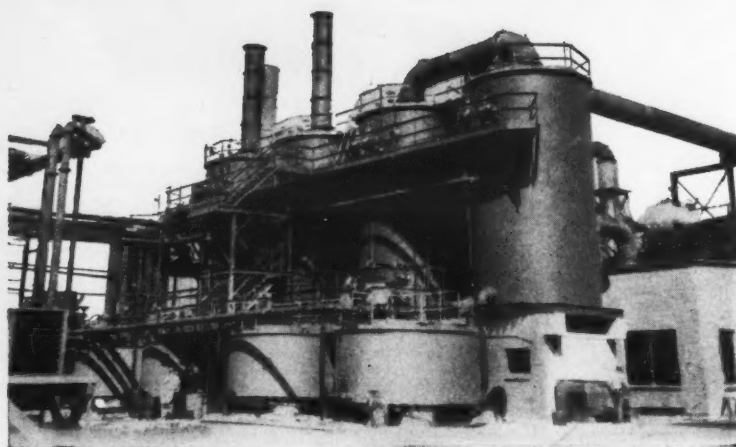
# GARLOCK

PACKINGS, GASKETS, OIL SEALS,  
MECHANICAL SEALS,  
RUBBER EXPANSION JOINTS

When inquiring check CP 7935 on handy form, pgs. 2-3



# This job called for VALDURA PARA-VAL



**because PARA-VAL provides  
SUPERIOR RESISTANCE  
to Acids and Alkalies!**

- ★ Not ONE saponifiable ingredient
- ★ Made with Chlorinated Rubber
- ★ Can be recoated in 3 hours
- ★ Gives added film thickness
- ★ Easy to apply

If you'd like to know more about Para-Val and other items in Valdura's complete line of specialized maintenance products, or if you'd like help with a particular problem, just state your wishes on your regular letterhead and mail to the address below. Your inquiry will be treated as an invitation to provide service... not as a license to exert selling pressure!



**VALDURA HEAVY DUTY PAINT DIVISION**

**AMERICAN-MARIETTA CO.**  
101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 7936 on handy form, pgs. 2-3

## MAINTENANCE

**Pressures to 250 psi  
handled by oil  
separators...**

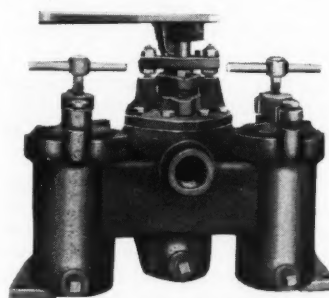
filters can be used for fine or coarse separation

**Uses:** Units are to be used mainly in circuits of manufacturer's "CF" closed-flame gas-oil burners.

**Features:** Both simplex and duplex oil separators will handle pressures up to 250 lb.

Filters can be used for coarse straining or fine filtration. Perforated metal strainers are used for separating particles down to 1/64". For finer separation, either metal or fabric cloth filters are used, depending on degree of filtration required. Strainers and filters are interchangeable.

**Description:** Construction of separators makes cleaning or interchanging of strainers and filters an easy matter. A yoke holder at top of filter housing simplifies removal of various elements. Both separators have adjustable positioning collars for accurate location and seating of a hand lapped rotor. There are no springs in units to cause wedging of rotor to its seat.

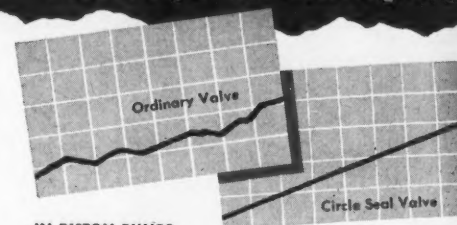


Separator's strainers and filters are interchangeable

An adjustable stuffing box is completely independent, so gland adjustments are made without disturbing rotor clearance settings. Larger sizes of separators have pressure balancing valves for easy turning under high pressure conditions. A wide range of strainers and filters are available for these units.

(Oil separators are a product of Eclipse Fuel Engineering Co., Dept. CP, 1119 Buchanan St., Rockford, Ill. . . . or for more information check CP 7937 on handy Reader Service slip which is located between pages two and three.)

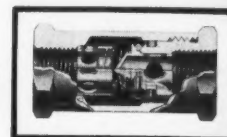
## Check Valve Leakage Destroys Efficiency...



**IN PISTON PUMPS  
IN PLUNGER PUMPS**

In hydraulic pumps, in chemical proportioning pumps—where constant volume must be maintained and leakage cannot be tolerated, Circle Seal Check Valves with floating "O" Ring construction provide the perfect answer because...

**Circle Seal  
Check Valves  
NEVER Leak!**



Write for catalog information today

**CIRCLE**



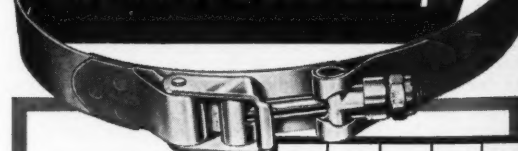
**SEAL precision valves**

**JAMES POND CLARK**

2181 E. Foothill Blvd., Pasadena 8, Calif.

When inquiring check CP 7938 on handy form, pgs. 2-3

**MAKE  
You can save money  
and time with  
MARMAN Band Clamps**



**Quick-Coupler Clamp...** a Marman design for instant removal and installation...Stainless Steel... tough, corrosion resistant, vibration proof.

There is a Marman design for every clamping operation. Order quick-coupler clamp direct from this advertisement. Write, wire or phone for catalog or engineering assistance. CP-4

SERIES NO.	360	365	450	455
MIN. WIDTH	5/8"	5/8"	3/4"	3/4"
BAND GAGE	.020	.020	.025	.025
BOLT SIZE	10-32NF-2 x 1 3/4"	10-32NF-2 x 2 1/4"	3/4-20NF-2 x 2 1/4"	3/4-20NF-2 x 3 1/4"
MIN. DIA.	2	3	4	7

**MARMAN**  
PRODUCTS CO., Inc.

11214 EXPOSITION BLVD.  
LOS ANGELES 64, CALIF.

7-434

When inquiring check CP 7939 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Chemical  
shown b  
polyethy

Uses: For  
crystalline

Features:  
is said to  
as well as  
is also r  
odorless,

Description:  
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have hig  
plug up  
ments p  
flexing p  
(Feon f  
Fabrics  
155 Ora  
7940 on

Gives s  
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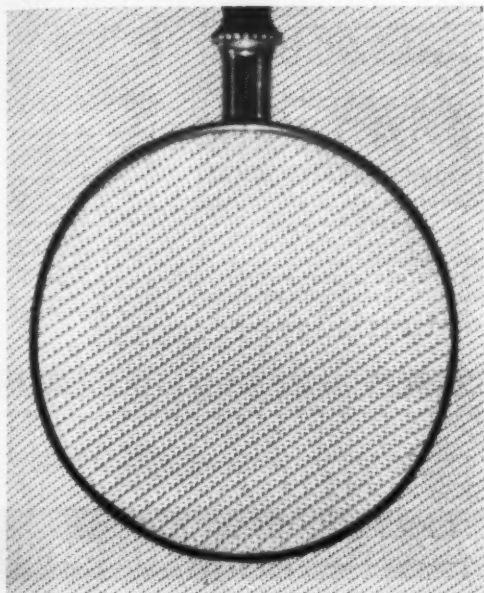
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APRIL,

**Chemical and abrasion resistance  
shown by filter fabric woven of  
polyethylene monofilaments**

**Uses:** For free-filtering applications such as coarse crystalline materials or fibrous pulps.

**Features:** Excellent chemical and abrasion resistance is said to give fabric long life. It withstands alkalis as well as inorganic acids, and at room temperature is also resistant to many organic chemicals. It is odorless, tasteless and non-toxic.



**Description:** Woven of polyethylene monofilaments, the cloth has a relatively open mesh, somewhat similar to fine wire cloth. In application, it is said to have high filtering efficiency, and does not blind or plug up in continuous operation. Its smooth filaments permit easy cleaning. Cloth has excellent flexing properties even at sub-zero temperatures.

(Feon filter fabric is a development of Filtration Fabrics Div., Filtration Engineers, Inc., Dept. CP, 155 Oraton St., Newark 4, N. J. . . . or check CP 7940 on handy form, pages 2 and 3.)

**Gives specs on end frame  
for special scaffolding**

Specifications and uses of demountable end frame for special scaffolding applications are described in literature. Designed to pass through narrow openings between boilers, watertanks and into other confined places where conventional scaffolding must be ruled out, frame is available in widths varying from 3 to 5'.

Form DF-1 is issued by Dept. KP, Waco Mfg. Co., Dept. CP, 3565 Wooddale Ave., Minneapolis 16, Minn. When inquiring specify CP 7941 on handy form, pages 2 and 3.

# ERIEZ PERMANENT MAGNETIC DRUMS

## Remove Dangerous Tramp Iron

### From Food and Chemical Processing



Dangerous tramp iron *can* be removed from food and processing lines! Product contamination, machinery damage and fires caused by stray scraps of iron *can* be halted! Eriez Magnetic Drums are tailored to fit exact needs at the discharge of gravity flow chutes, spouts, screw conveyors and other conveyor systems by removing ferrous metal from wet or dry materials passing over the drum, automatically and efficiently.

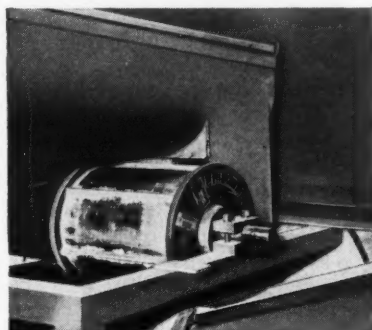
An Eriez Drum is a revolving, cylindrical shell within which a bank of stationary high powered Alnico V magnetic castings is located. They are permanent magnets. They will last in-

definitely. They are non-electric . . . there are no electric currents . . . no wires or batteries. The maintenance is simple. Cleaning is automatic.

Eriez Drums are constructed with stainless steel shells . . . they are dust-proof, rust-proof. Wipers or ribs built into the drums provide greater structural strength, and assure positive tramp iron discharge minimizing abrasive wear.

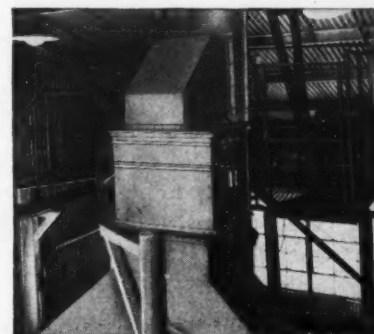
*Eriez Magnets were specified as the preferred magnets in a recent private industry survey!*

Eriez Bulletin gives you full information. It is yours for the writing.



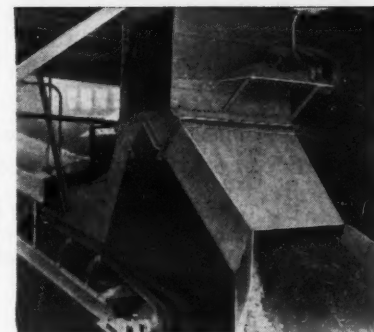
Eriez Permanent Drum shown at discharge end of screw conveyor in a large processing plant. Unit built with rugged stainless steel shell. Standard sheave-wiper blades guarantee "tramp iron" drop-off.

Eriez Drum & Housing Model DF-102 following a screw conveyor in a processing mill. Also easily installed at the discharge of a spout conveyor and an open or closed chute. Adjustable check gate regulates and feeds material evenly.



Eriez Drum & Housing Model DF-101 installed ahead of bagging operation in an Eastern chocolate firm. Unit is a feeding device as well as a magnetic separator. Dust-tight housing is standard!

Eriez Drum & Housing Model DF-101 with motor, on a heavy processing drier. The 12-inch model has a 1/4 hp. motor and the 18-inch model has a 1/2 hp. motor. Motorized units have identical drum and housing features as those without a motor.



Eriez Plate Magnets can also be applied profitably to the removal of tramp iron in many food and chemical processing lines. Which Eriez Plate Magnet do you need? There is a free Plate Magnet Selector Chart which will help you find the most efficient plate magnet for your specific application. Write for it.

#### Permanent Magnetic

**Super Sweeper Keeps Factory Aisles,  
Lots, etc. Free from Nails, Scraps**

Eriez Super Sweeper removes dangerous tramp iron from floors, parking lots, warehouses, etc. Four sizes in three magnetic strengths. Manual or mechanical operation . . . and you can pull it, push it or suspend it. Write for Bulletin on this versatile trouble saver.



## ERIEZ MAGNETS



ERIEZ MANUFACTURING COMPANY 73D Magnet Drive, Erie, Pa.

Please send me:

Eriez Magnetic Drum Bulletin ☐

Eriez Super Sweeper Bulletin ☐

Eriez Plate Magnet Selector Chart ☐

Name.....

Address.....

Company.....

Title.....

When inquiring check CP 7942 on handy form, pgs. 2-3

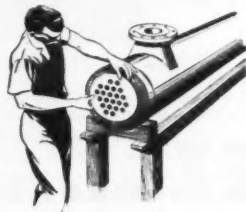


# The single cost of TANTALUM is much less than the many costs of CORROSION...

Corrosion costs do not end simply with equipment replacement. A complete analysis must include shutdowns, lost production time, product contamination and spoilage, fume damage to buildings and associated equipment, possible injury to personnel. Compare this myriad of costs against the single outlay for Tantalum, the metal that is not merely "corrosion-resisting", but acid-proof.

If you are processing hot or strong acid solutions, if you are making a pure product in which equipment contamination or side reactions cannot be tolerated, tantalum is probably the most economical material of construction you can use. Experienced Fansteel engineers are at your service for consultation at no cost to you.

Use Tantalum with economy for most acid solutions and corrosive gases or vapors except HF, alkalis, or substances containing free SO<sub>3</sub>.



Ask for a copy of our free booklet  
"Acid-Proof Tantalum Equipment for Chemical Operations"

FANSTEEL METALLURGICAL CORPORATION  
NORTH CHICAGO, ILLINOIS, U.S.A.

32402C

When inquiring check CP 7943 on handy form, pgs. 2-3

## MAINTENANCE

**For dangerous locations,  
1 hp rt angle motor has  
speeds to 155 rpm**

**Uses:** For locations where dangerous fumes, flammable gases, explosive substances, or combustible dusts may exist.

**Features:** Available in 1 hp rating with speeds from 45 to 155 rpm, 3-phase AC motor is designed to comply with UL specifications for Class I — Group D, and Class II — Groups F and G service.

**Description:** Right-angle Syn-cro gear motor, designated Type SESV-GW, incorporates a cantilever design to protect gear alignment. Mounting stresses are ab-



Meets UL specifications

sorbed by one-piece base, freeing gear and motor housing of distortion. Unit embodies splash lubrication, a hardened and ground worm, normalized castings, and asbestos-protected windings.

(Motor is a product of US Electrical Motors, Inc., Dept. CP, Box 2058 Terminal Annex, Los Angeles 54, Calif. . . or for more information check CP 7944 on handy form, pages 2 and 3.)

**Savings to 60% result  
with commercial  
bearing use**

**Uses:** For applications where speeds and loads are moderate enough to allow use of commercial bearings.

**Features:** Bearing, the CS 3258, uses a molded plastic seal. In applications where unit has been used to replace a more costly precision bearing, resulting savings are said to have ranged to 60%.

**Description:** Bearing has carburized and hardened raceways, and all surfaces are ground. It is avail-

## IT EMPTIES EVERY TIME and every time it empties, it SAVES YOU MONEY!

Your bankroll is taking as bad a beating as your buckets—if you have to kick, bang and batter them constantly to get them clear of jammed or frozen plugs of granular or powdered material.

Loads can't stick in PEKAY M-T-Matic buckets, even if frozen or close-packed! The separately mounted stripper plate applies irresistible leverage to bucket contents—empties completely on every trip! You handle more material at the same or higher belt speeds—cut belt replacements too!

**the patented  
PEKAY M-T-MATIC  
ELEVATOR CONVEYOR BUCKET**

**Available in all standard sizes**  
Thousands of M-T-Matics now in use are making money for users everywhere, handling chemicals, sand, other materials. Easy to install on any elevator conveyor. Quick deliveries!

**Write today for low prices!**

Separately mounted back automatically acts as stripper-plate to assure complete emptying. Irresistible leverage develops as bucket goes over top pulley, sweeping contents entirely clean. Buckets have standard pickup capacity. Double mounting makes belts last much longer.

**PEKAY MACHINE & ENGINEERING CO.**

872 N. SANGAMON STREET

CHICAGO 22, ILLINOIS

When inquiring check CP 7945 on handy form, pgs. 2-3

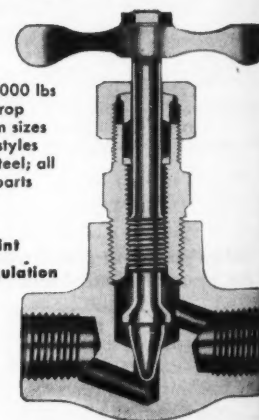
## Protect Meters, Instruments

### Edward Gage Valves

Moderately priced, these low cost compact valves find many applications for gage, meter and instrument service. Rated conservatively for 4000 lbs at 150F, 600 lbs at 750F, these drop forged steel valves are furnished in sizes from 1/4" to 1". Globe and Angle styles in three body materials—carbon steel; all parts 13% chromium steel; or all parts 18-8 stainless steel. Construction features include:

- tight tapered body-bonnet joint
- semi-needle stem for fine regulation
- wide seat joint for tight seating
- bonnet and packing nut plated to reduce galling and corrosion

For complete information write for Catalog 104.



Another  Product

**Edward Valves, Inc.**

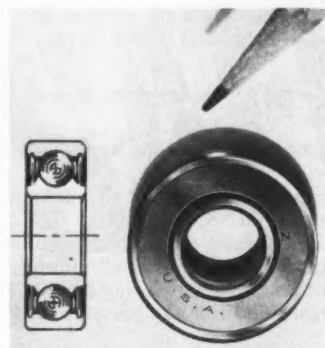
Subsidiary of ROCKWELL MANUFACTURING COMPANY  
1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 7946 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MAINTENANCE

able in either English or metric sizes, OD ranging from  $\frac{5}{8}$  to 2.047" (52 mm), bore from  $\frac{3}{16}$  to 1", with or without plastic seals and/or metallic shields.



Available in English or metric sizes

Depending on material used for bearing, it is reported possible to get up to 75% of the load rating of a comparable precision bearing at 10,000 rpm.

(Commercial bearing is a product of The Schatz Mfg. Co., Dept. CP, 6762 Fairview Ave., Poughkeepsie, N. Y. . . . or for more information check CP 7948 pages 2 and 3.)

### Redesign simplifies centrifugal fan ventilator

Redesign and simplification of centrifugal fan ventilator has recently been announced by company. Unit is primarily for low noise level dust exhaust applications.

Included on the ventilator is a one-section hood, lifting on swing-hinges in smaller models and removable on large sizes. Hood covers motor chamber and directs air exhaust downward for dispersion over roof. Removal of hood provides easy access to motor and fan chambers for servicing and cleaning.

Centrifugal fan ventilator, designated Airlift, is cataloged in 14 sizes and a wide range of available capacities at static pressures from 0 to  $\frac{7}{8}$ ".

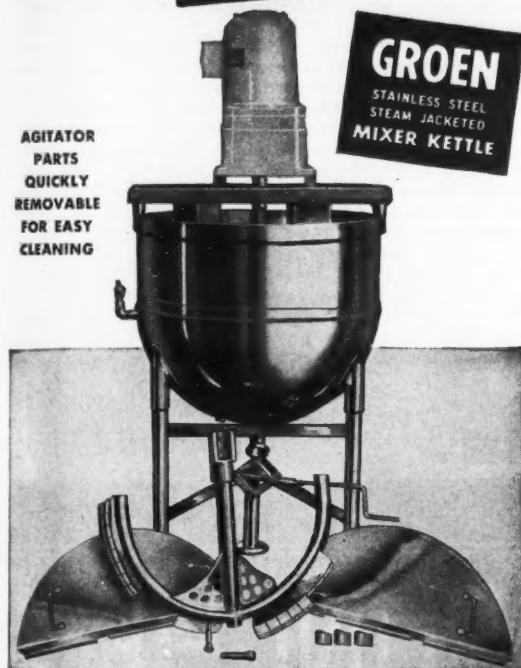
(Ventilator is a product of The Swartwout Co., Dept. CP, 18511 Euclid Ave., Cleveland, Ohio . . . or for more information check CP 7949 on handy form, pages 2 & 3.)

# WITH Model RA

## It's easy TO DO BETTER MEDIUM TO HEAVY MIXING

AGITATOR PARTS QUICKLY REMOVABLE FOR EASY CLEANING

**GROEN**  
STAINLESS STEEL  
STEAM JACKETED  
MIXER KETTLE



## COMPLETELY SANITARY!

ASK US ABOUT THE HIGH SPEED ROTA-THERM JACKET

Attains fastest cooking speed ever produced by any kettle! Multiple steam inlet design develops high velocity steam circulation instantly. No air pockets . . . no cool areas, possible. Gives all advantages of stainless steel plus swift operation. Ask for Bulletin RT-1.

Stainless steel throughout. Fully sanitary—meets the strictest Health Dept. requirements. Equipped with GROEN-exclusive demountable shaft couplings which cannot disengage in operation, yet permit removal of agitator assembly in a few seconds for easy cleaning. • Large revolving scraper blades maintain movement of contents away from heated walls into baffle. Small blades below prevent settling. Efficiency is positive . . . results dependable. Bulletin RAK-2 gives full, illustrated details. Write for your copy today.

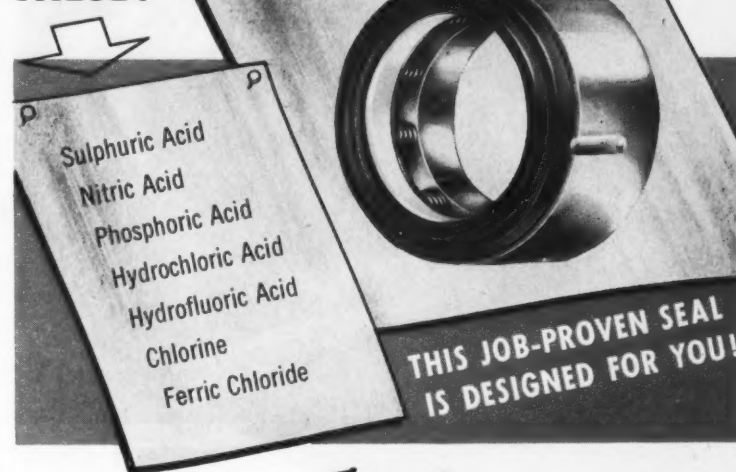
# GROEN MFG. CO.

4531 W. Armitage Ave., CHICAGO 39, ILL.  
30 CHURCH ST. NEW YORK 7  
HART A. CENTURY OF THE KETTLES 2 FRONT STREET SAN FRANCISCO 11

When inquiring check CP 7947 on handy form, pgs. 2-3

APRIL, 1954

## HANDLING CORROSIVES LIKE THESE?



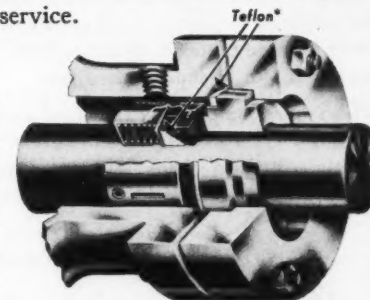
THIS JOB-PROVEN SEAL IS DESIGNED FOR YOU!

## JOHN CRANE Type 9 MECHANICAL SEAL

Performance records plainly prove that this "John Crane" development has successfully solved the handling of the most difficult corrosive liquids and gases. Where conventional type seals had failed, the Type 9 has done the job. It continues to answer new problems, including temperature conditions from -120°F. up to 500°F.

Designed to withstand practically all chemicals, the Type 9 incorporates a flexible wedge ring and sealing ring molded from DuPont's Teflon. It is engineered for the particular application and can be furnished in the metallurgical specification best suited to the service.

Your toughest problem can be the Type 9's next success story. Use it on all rotating shaft applications, including: centrifugal, rotary pumps, mixers, agitators, autoclaves, other equipment.



Get complete information on the Type 9 Seal from Crane Packing Co., 1821 Cuyler Ave., Chicago 13, Ill.

In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N., Hamilton, Ont.

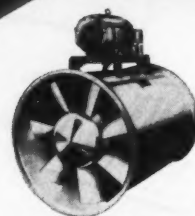
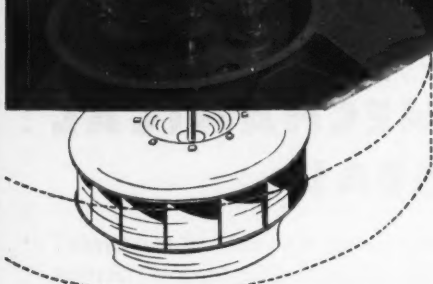
\* Du Pont trademark

## JOHN CRANE CRANE PACKING COMPANY

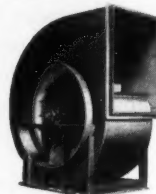
When inquiring check CP 7950 on handy form, pgs. 2-3



# OUT OF THE "BUFFALO" PUNISHMENT PIT—



"Buffalo"  
Axial Flow Fan



"Buffalo"  
Type "BL"  
Limit Load  
Ventilating Fan

## COME BETTER FANS FOR YOU

To be sure that "Buffalo" rotors can stand far greater stress than they would ever encounter in an installation, we deliberately try to destroy them in this "Buffalo" vacuum test pit! Here, in a partial vacuum, the rotor to be tested can be revolved at tip speeds as high as 60,000 and even 70,000 feet per minute. The slightest unbalance, the slightest structural weakness, would result in destruction of the rotor at these fantastic speeds — and it shows up here in the Punishment Pit, not in the installed fan.

This is just one phase of the rigid testing and excellence of engineering, or "Q" Factor\*, which assures you of a best buy when you specify "Buffalo" Fans. Why not write for "Buffalo" engineering literature on *your* air handling problem?

\* The "Q" Factor — The built-in Quality which provides trouble-free satisfaction and long life.

**"Buffalo"**

## BUFFALO FORGE COMPANY

524 Broadway Buffalo, New York  
PUBLISHERS OF "FAN ENGINEERING" HANDBOOK  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.  
Sales Representatives in All Principal Cities

VENTILATING PRESSURE BLOWING COOLING HEATING FORCED DRAFT  
AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING

When inquiring check CP 7951 on handy form, pgs. 2-3

## MAINTENANCE

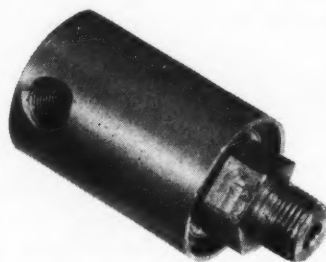
Only seven parts  
make revolving  
joint . . .

handles air, water, oil, and  
gas pressures

**Uses:** For use on air and hydraulic brake and clutch applications.

**Features:** Joint consists of only seven parts.

**Description:** High speed revolving joint contains a bearing lubricated for life. It is manufactured in both 1/8 and 1/4" straight threads. Unit is reported to be very small in over-all dimensions and low in turning torque. Rotating seal is a non-porous, heat-



Revolving joint has small over-all  
dimensions

treated carbon. Stationary seal is a standard oil-resistant O-ring. Joint is capable of handling air, oil, water, and gas pressures, at normal temperatures.

(Revolving joint is a product of Rotherm Engineering Company, Inc., Dept. CP, 7280 W. Devon Ave., Chicago 31, Ill. . . or for more information check CP 7952 on handy form, pages 2 and 3.)

## How to control corrosion with porcelain

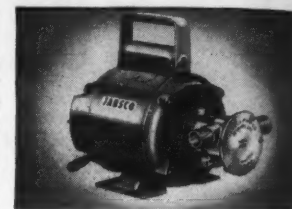
Manufacturer's complete line of chemical porcelain equipment is covered in eight-page bulletin. Included are pipe, fittings, spacers, valves, joints, sight glasses, flanges, ejectors, and tower packing.

Bul CP-50 is issued by The U. S. Stoneware Co., Dept. CP, 5300 E. Tallmadge, Akron 9, Ohio. When inquiring specify CP 7953 on handy form, pages 2 and 3.

## NEW JABSCO PORTABLE SELF-PRIMING MOTOR-PUMP UNIT

Weights only 29 lbs.  
List Price \$58.50

Jabco announces the immediate availability of the outstanding Model 2187 Portable Motor-Pump Unit, with capacity of 600 GPH at 10' head. Satisfied users find this versatile unit solves many pumping needs in industrial, farming, plumbing and marine uses. Model 2187 pumps coolants, circulates and transfers liquids, returns spilled liquids to process, drains cellars and sumps, pumps waste water to sewer, pumps out flooded basements, cesspools, and many other vital uses. Model 2187 is equipped with a close-coupled Jabco bronze Pump with mechanical seal. Ports are threaded for standard 3/4" external garden hose connections, with 1/2" IPS optional upon request. Heavy duty capacitor type 1/4 HP Wagner electric motor with overload protector powers the unit. Motor is rated at 1725 RPM, 60 cycles—115 volts A.C. Comes with 6 ft. cord with ground wire and plug. Form-fitting handle folds away for easy storage. Also available at additional cost, D.C. motor units, 32 volt and 110 volt. Model 2187 is ready for instant use, and requires no additional equipment. No lubrication is required, no contamination of liquid pumped. Instantly self-priming with dry suction lifts to 15', up to 25' primed. For complete information, write **Jabco Pump Company**, 2031 North Lincoln Street, Burbank, California.



When inquiring check CP 7954 on handy form, pgs. 2-3

# PUNCHES and DIES

IMMEDIATE DELIVERY  
ON MOST STANDARDS

4 to 5 WEEKS DELIVERY  
ON SPECIALS

## ARTHUR COLTON COMPANY

Div. Snyder Tool & Engineering Company  
3465 E. LAFAYETTE • DETROIT 7, MICHIGAN

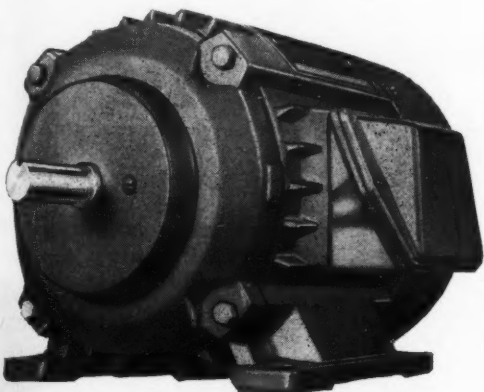
When inquiring check CP 7955 on handy form, pgs. 2-3

### Better protection featured in line of electric motors . . .

units conform to recently-adopted NEMA standards

A line of squirrel-cage induction motors has recently been announced by manufacturer. Included are protected and enclosed AC motors for all industrial purposes. Line is built to conform to recently-adopted NEMA standards.

Featuring better protection than in previous designs, the first of the motors to appear will be built for 1, 1½, and 2-hp applications, in frame sizes 182 and 184. Balance of line, up to and including 30 hp, will be introduced at regular intervals during 1954 and early part of 1955. Manufacturer's present AC line will continue to be available during this changeover period.



Totally enclosed fan-cooled squirrel-cage induction motor

(Electric motors are a product of Reliance Electric & Engineering Co., Dept. CP, 1088 Ivanhoe Road, Cleveland 10, Ohio . . . or for more information check CP 7956 on handy form which is located between pages two and three.)

### Shows method of joining pipe to moving machine parts

Self-aligning swivel joints for piping are described in 12-page illustrated bulletin. Joints are used in forming "dog leg" piping connections to movable machine parts, or simple pivot point pipe connections where piping line is connected through a hinge pin or hub. Manufacturer has 14 styles, 8 different sizes from ¼ to 2". Choice of four different service specifications can be had for handling temperatures from -500 to 600°F and pressures from vacuum to 600 psi steam or 3000 psi hydraulic.

Cat 265-A may be obtained from Dept. J-13, Barco Mfg. Co., Dept. CP, 501 Hough St., Barrington, Illinois. When inquiring specify CP 7957 on handy form, pages 2 and 3.

# SAFE CONTROL

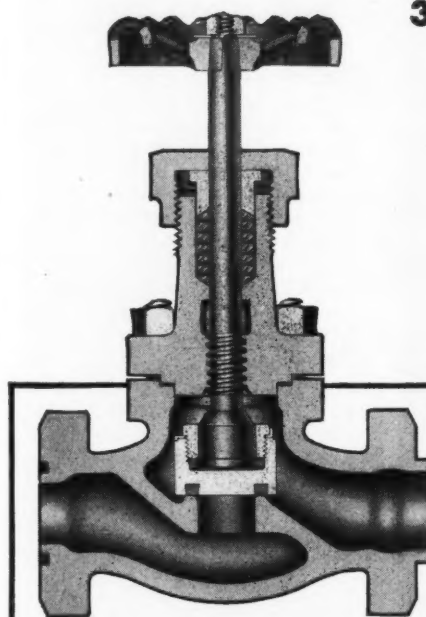
for ammonia and other  
hard-to-handle fluids

## CRANE

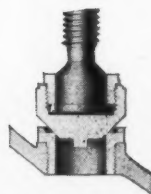
### 300-pound heavy-duty all-iron valves

Put these Crane valves to the test—use them for ammonia, air, oil, gas, caustic solutions, chlorinated compounds, alcohols—for chemicals and process work. Their rugged bodies of Ferroteel (35% stronger than cast iron) . . . their precision seating designs . . . the unusually deep stuffing box and high-grade packing . . . the sweeping interior body contours . . . assure the safety and lasting service you want.

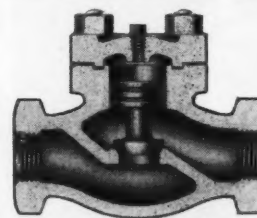
The line includes *bolted bonnet* globes and angles with choice of disc, *union bonnet* globes and angles with plug-type disc, lift checks, expansion valves, relief valves, liquid gauges—and all the fittings, flanges, return bends and other specialties for a complete Crane Quality installation. Check with your Crane man.



Cross-section bolted bonnet Globe, with flanged ends and special lead-faced disc. Sizes ¼ to 4-inch.



Bolted bonnet Globes also available with steel disc and seat where high temperatures or corrosion prohibit use of lead.



Cross-section, Lift Check with bolted cap, and cushioned disc action which increases valve life. Sizes ½ to 2-inch.



New 6-page folder AD1977 catalogs this complete Crane line. Write direct, or ask your Crane Representative.

THE BETTER QUALITY . . . BIGGER VALUE LINE . . . IN BRASS, STEEL, IRON

## CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois  
Branches and Wholesalers Serving All Industrial Areas



VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 7958 on handy form, pgs. 2-3

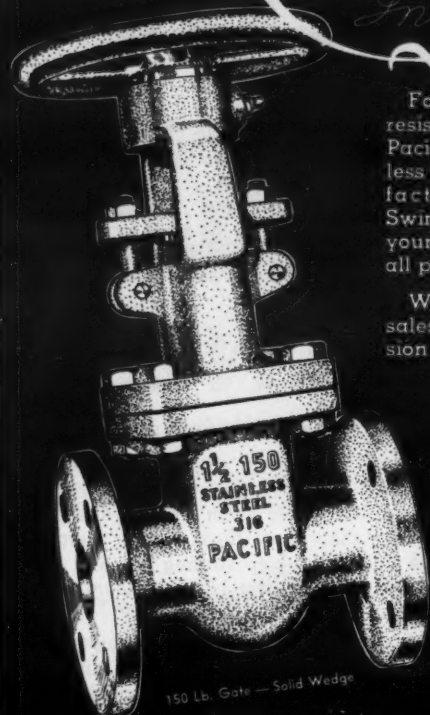


# PACIFIC VALVES

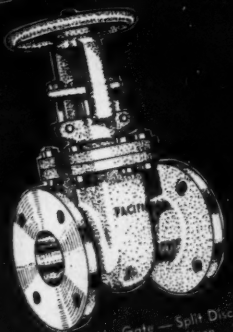
## QUALITY

For dependable corrosion resistant valves, investigate Pacific's complete line of stainless steel valves. Pacific manufactures Gate, Globe and Swing Check Valves to meet your material specifications, in all popular sizes and pressures.

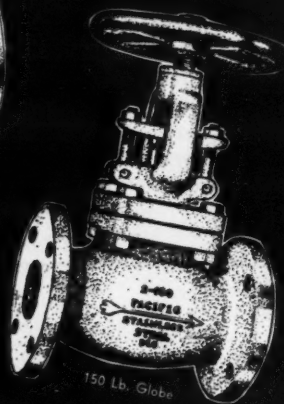
Write today for Pacific's new sales brochure SS101 "Corrosion Resistant Valves."



150 Lb. Gate — Solid Wedge



150 Lb. Gate — Split Disc Lightweight Pattern



150 Lb. Globe

### PACIFIC VALVES, INC.

3201 WALNUT AVENUE • LONG BEACH 7, CALIFORNIA

Sales Offices In All Principal Cities



150 Lb. Swing Check

150 Lb. Gate

150 Lb. Swing Check

150 Lb. Gate

150 Lb. Gate

When inquiring check CP 7959 on handy form, pgs. 2-3

## MAINTENANCE

**Weight of only 27 ounces makes electrode holder easy to handle**

**Uses:** Designed to handle electrodes through 5/16", unit will hold rods as small as 3/32" diameter.

**Features:** This 400-amp manual electrode holder weighs just 27 oz.



Electrode holder's handle is designed to remain cool

**Description:** Holder, designated Model A-516, has air vents between holder castings and insulation. On higher amp work this allows heat from arc, which is absorbed by castings, to be dispelled through ventilating ducts between casting and insulators.

To keep holder cool, it is supplied with a large diameter handle that has only point contact with holder casting, permitting a free flow of cooling air. Wedge-shaped upper jaw permits maximum pressure with minimum contact area for a cooler running holder. Unit is supplied with laminated glass cloth insulation that resists extreme heat and impact, according to manufacturer.

(Electrode holder is a product of Tweco Products Company, Dept. CP, Boston at Mosley, Wichita 1, Kans. . . or for more information check CP 7960 on handy form, pages 2 and 3.)

### Handy reference chart for rubber tubing

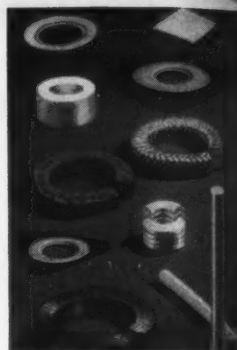
Handy chart of manufacturer's line of rubber tubing hangs on wall for quick reference in store-rooms and laboratories. Chart is standard 8 1/2 x 11", includes 18 actual size illustrations of amber and black tubing. Dimensions, physical properties are included.

Rubber tubing wall chart is available from Arthur S. LaPine & Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. When inquiring specify CP 7961 on handy form, which is located between pages 2 and 3.

Seven reasons why so many chemical packing problems are being solved by

**R/M Teflon\***

1. "TEFLON" is not affected by chemicals except fluorine gas and molten alkali metals within the temperature range of -80° F. to 500° F.
2. "TEFLON" is exceptionally strong and tough.
3. "TEFLON" has excellent nonadhesive properties.
4. "TEFLON" is nonflammable.
5. "TEFLON" possesses excellent electrical properties.
6. "TEFLON'S" water absorption is zero.
7. Weather does not affect "TEFLON."



R/M "TEFLON" Packings and Gaskets are available in a variety of combinations and for practically all kinds of fluid-handling equipment. If you cut your own gaskets or fabricate parts, order R/M "TEFLON" in rods, sheets, tubes or tape to specification. Whatever your packing problem, see your authorized R/M distributor. He has the answer for you.

\*Du Pont's trade-mark for its tetrafluoroethylene resin.

**R/M**

## PACKINGS

RAYBESTOS-MANHATTAN, INC.  
PACKING DIVISION, MANHEIM, PA.

When inquiring check CP 7962 on handy form, pgs. 2-3



THE AMERICAN PROD. CO., 3308 Edison Ave., New York 69

Please send illustrated literature and price list.

Name .....  
Company .....  
Street .....  
City ..... Zone ..... State .....

Please send complete sample Paint Roller Kit—9 inch size. Includes tray—\$5 payment enclosed ☐

When inquiring check CP 7963 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Heat-st allows former

prim tur

Uses: pressure for indoor proof ja line appl

Insulat

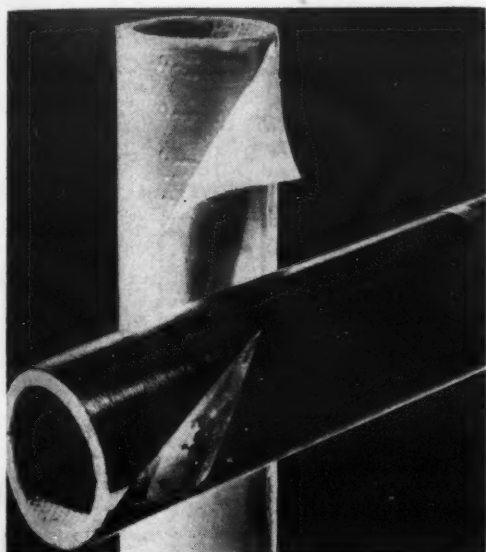
Features thickness formance common glass of handling Descript covering lines and kraft pa water lin Fiberglass stand up glass wil weatheri loss of shrink a temperat and manufac

(Low pr Corning Nicholas formation may simp between

**Heat-stopping value of insulation allows 1/2" thickness to do work formerly requiring 1" . . .**

primarily for indoor applications in low temperature field

**Uses:** For use on cold water, hot water, or low pressure steam lines. Pipe insulation is primarily for indoor applications, but with addition of a water-proof jacket it is suitable for outdoor use. Cold line application is limited to cold water temperatures.



Insulation has covering of canvas or asphalt saturated paper

**Features:** Due to its heat-stopping value, a 1/2" thickness of this pipe insulation is said to equal performance of 3/4 to 1" thicknesses of other materials commonly used in low pressure field. Fine fibers of glass of which insulation is composed afford pleasant handling and provide high thermal efficiency.

**Description:** Insulation is available with a canvas covering for installation on hot water or low pressure lines and with a black jacket of asphalt-saturated kraft paper to protect against condensation on cold water lines.

Fiberglass low temperature pipe insulation is said to stand up under long service because inert fibers of glass will not rot or corrode. Prolonged accelerated weathering tests indicate no breakdown of fibers or loss of efficiency due to aging. Material will not shrink and won't buckle or sag under changes in temperature and humidity. Appearance is improved and maintenance costs are reduced, according to manufacturer.

(Low pressure pipe insulation is a product of Owens-Corning Fiberglas Corporation, Dept. CP, 1833 Nicholas Bldg. Toledo 1, Ohio . . . or for more information concerning manufacturer's product, reader may simply check CP 7964 on handy form, located between pages two and three).

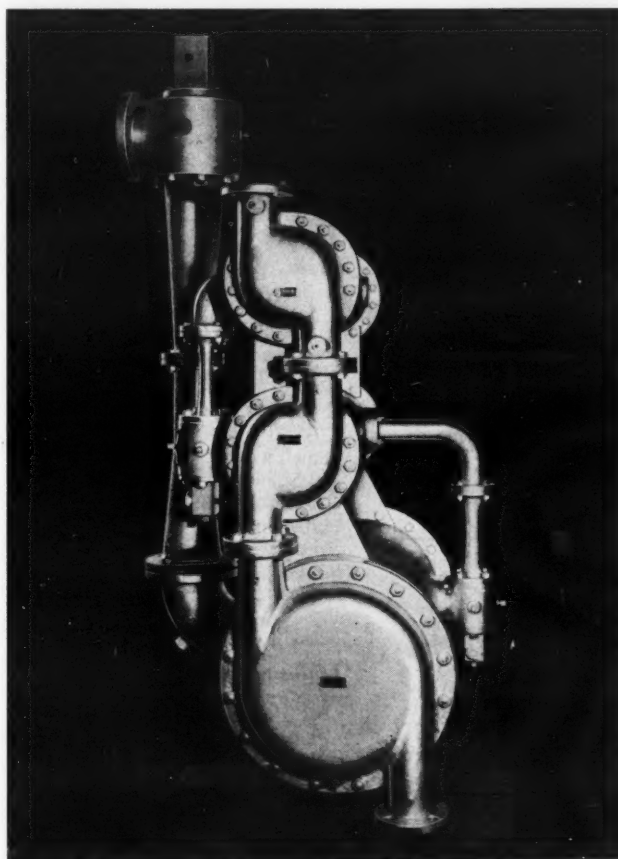
# ELLIOTT three-stage ejector with a double purpose...

1

To pull the vacuum required in processing a chemical product—

2

To recover a valuable solvent used in the process, and return it for further use.



For meeting the last requirement, this unit has surface-type intercondensers, as well as an aftercondenser which recovers the solvent from the exhaust of the final stage. The set-up is enough out of the usual to call for the experienced skill of Elliott specialists in developing the unit in all its details, insuring thoroughly satisfactory performance with maximum economy. As the photo shows, the assembly is neat and compact, requiring surprisingly little space for the work it does. Furthermore, as with all Elliott ejector installations, it can be installed almost anywhere with little consideration for the convenience of maintenance, since it has no moving parts and nothing to wear.

Why not utilize the experience of Elliott vacuum engineers in your next problem? Talking it over implies no obligation. For general information, ask your local Elliott field engineer for a bulletin describing the ejector you need, or write Elliott Company, Industrial Process Division, Jeannette, Pa.

## ELLIOTT Company



G4-1



TURBINE-GENERATORS



TURBINES



MOTORS



GENERATORS



DEAERATING HEATERS



EJECTORS



CONDENSERS



COMPRESSORS



TURBOCHARGERS



TUBE CLEANERS



STRAINERS

When inquiring check CP 7965 on handy form, pgs. 2-3



- CLOTH FOR HOT ACID FILTRATION
- CLOTH FOR HOT DUST COLLECTION

USE CLOTH MADE FROM  
"ORLON\*"

This cloth is available in standard width of 38" from stock. We will weave any desired width from 26" through 72" to your order in quantities as low as 100 linear yards.

We have a background of over Forty Years in weaving Industrial Fabrics . . . we weave all of our own Synthetic Fiber Filter Fabrics. We have the "know how" necessary to produce uniform Filter Cloth with outstandingly superior operating characteristics.

Literature and pilot test sample available on request.

We also weave filter cloth of VINCEL†, SARAN, DYNEL, NYLON, VINYON N\*\*, GLASS, DACRON††, TEFLON\*\*\*, POLY-ETHYLENE.

. . . for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, chemical resistant, high burst factor, abrasion resistant and crease resistant. Send for a test sample.

\*TM for duPont Acrylic Fiber  
†TM—NFM Reg. U. S. Pat. Off.  
\*\*TM UC&C Co.  
††TM for duPont Polyester Fiber  
\*\*\*TM for duPont Tetrafluorethylene Fiber

If high operating temperatures are your problem we suggest you try this NFM cloth made from ORLON® Acrylic Fiber. Here are some of its values:

No loss of strength after 32 days exposure to air at 257° F.

Shrinkage not more than 2 1/2 % in water at 212° F.

Good resistance to hot mineral acids, weak alkalies, common solvents, oils, greases, neutral salts, most acid salts and chlorine.

Weavers of Industrial Filter Media for over Forty Years

**The National Filter Media Corp.**

General Offices & Mills: New Haven 14, Conn.  
Western Office & Factory: Salt Lake City 1, Utah

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Chicago, Ill. Cincinnati, Ohio Houston, Texas Oslo, Norway Johannesburg, South Africa  
2627 West 19th St. Roselawn Center Bldg. 1406 Second National Bank Bldg. Nicolai Friis Edward L. Bateman

When inquiring check CP 7966 on handy form, pgs. 2-3

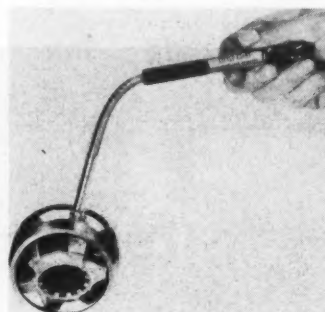
## MAINTENANCE

**Fountain pen size unit takes metallic chips from obscure places**

**Uses:** To remove metallic particles from hard-to-reach places.

**Features:** Small magnet, made of a highly magnetic alloy, is said to offer lifetime permanence through a single pole magnetic process.

**Description:** Unit is no larger than a fountain pen and can be carried in the pocket. It is mounted in a fiber non-conductive case with



May be carried in pocket

a pocket clip. Length of unit is 6 1/4". Two models are available: No. 15, with 1/4" diam; and No. 16, with 3/8" diam.

(Small magnet is a product of General Scientific Equipment Co., Dept. CP, 2700 W. Huntingdon St., Philadelphia 32, Pa. . . or for more information check CP 7967 on handy form, pages 2 and 3.)

### Bulletin illustrates line of plastic pumps

Line of "Flex-i-liner" plastic pumps is covered in four-page illustrated bulletin. Pumps have neither stuffing boxes, shaft seals, gaskets, nor internal valves. They are designed to handle corrosive and abrasive fluids. Bulletin contains diagrams, applications, operating specifications, performance data, and a list of available materials for body block and liner.

Bul on Flex-i-liner pumps is published by Vanton Pump & Equipment Corp., Dept. CP, Empire State Bldg., New York 1, N. Y. When inquiring specify CP 7968 on handy form, pages 2 and 3.

## New Book SHOWS YOU HOW TO HANDLE DRUM FLUIDS Faster



• If you handle fluids in drums, this little 24-page illustrated booklet can be a gold mine of ideas for you! An air-operated reciprocating pump, the amazing 13 lb. Fast-Flo operates on air as low as 35 PSI. Fits any bung opening, or can be clamped on tank sides. And Fast-Flo does not pressurize drums!

Fast-Flo can transfer, dispense, agitate . . . and be used as a supply pump for applying, mixing or spraying. Send for your copy of this Idea Book today!

GRACO Fast-Flo UNIVERSAL DRUM PUMP

**GRACO**

ENGINEERS AND MANUFACTURERS  
GRAY COMPANY, INC.

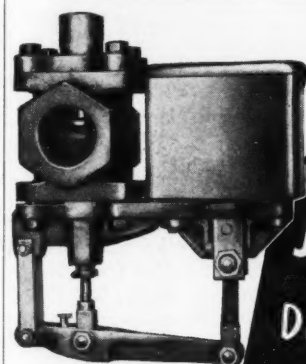
42 Grace Square, Minneapolis 13, Minn.

Regional Offices: New York, Philadelphia, Detroit, Chicago, Atlanta, San Francisco



When inquiring check CP 7969 on handy form, pgs. 2-3

## OUTSTANDING FOR STEAM SERVICE



Stainless steel valve and seat.  
Sizes: 1/2" to 3".  
Write for facts.

**JOHNSON**  
Direct Operated  
**SOLENOID VALVES**

Job after job, these Johnson Direct Acting Solenoid Valves are proving an ideal answer for service on steam lines. Their design removes the solenoid proper from the heat of the line, permits a leverage system with ample power to open against differential pressures up to 150 lbs. There are no pilot valves or auxiliary pistons, and construction is really heavy duty throughout. You will find their inherent simplicity and instant response will solve a lot of operating problems like no other valve can.



THE JOHNSON CORPORATION

826 Wood St., Three Rivers, Mich.

When inquiring check CP 7970 on handy form, pgs. 2-3

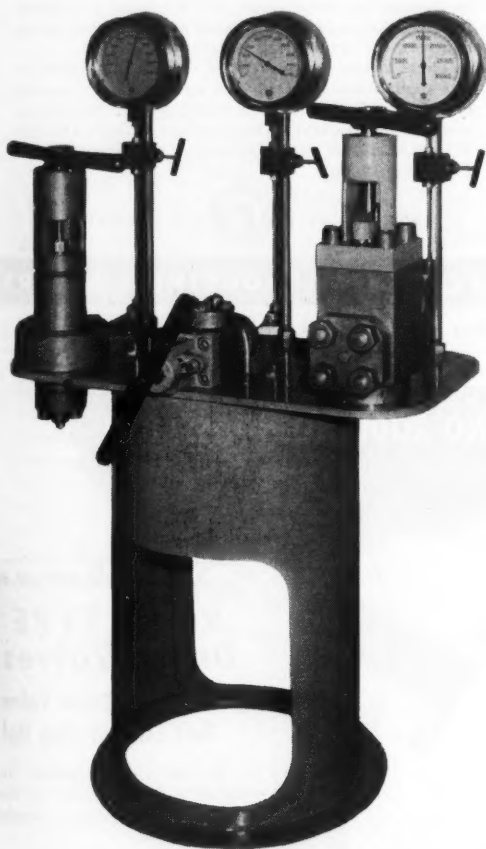
No drop shown by valves  
pressurized for  
a month . . .

working pressures to 30,000 psi offered by  
standardized units

Uses: For plant size operations.

Features: Valves shown were pressurized for full  
month without showing any drop, according to  
manufacturer.

Description: Valve on left is designed for 30,000  
psi. It has a  $\frac{5}{8}$ " diameter port and non-rising stem.  
Once valve is open, it operates on 25 ft-lb torque.  
Closing requires eight ft-lb of torque. This torque  
is required for about half a turn.



Peak capacity of valve in center is 6000 psi. It is  
equipped with  $\frac{3}{8}$ " port and rising stem. A torque  
of 25 ft lb is required to open.

Valve on right has a working pressure of 15,000 psi.  
Port is  $\frac{13}{16}$ " and stem is non-rising. Operating  
torque once valve is open is less than five ft-lb.  
Torque is required for less than half a turn. Design  
is available in larger sizes. All three valves are fur-  
nished with Teflon impregnated packing.

(High pressure valves are product of Autoclave  
Engineers, Dept. CP, Corner E. 18th & E. 19th St.,  
Erie, Pa. . . . check CP 7971, pages 2 and 3.)



Here's your modern "Mortar and Pestle"  
for accurate laboratory mixing

The **NEW SIMPSON LF MIX-MULLER**



1. SPRING-LOADED MULLERS . . .  
designed to exert more or less pres-  
sure, as adjusted. Mullers weigh only  
30 lbs. but can be adjusted to exert  
up to 80 lbs. pressure.

2. ADDITIONS FUNNEL — DUST  
COVER . . . arranged so the funnel  
directs liquid additions directly to the  
material bed—without removal of  
dust cover or splashing of liquids.  
Tight fit of light spun-metal cover  
assures dust-free operation. (Hood not  
shown in photo.)

3. WORKING AREA . . . integral  
casting of mixer and motor base pro-  
vides adequate working area for tools  
or other laboratory appliances . . .  
also assures proper and permanent  
alignment of drive.

4. CIRCULAR LEAK PROOF DIS-  
CHARGE DOOR . . . machined for  
tight fit and smooth operation. Large  
door, clear space provides for quicker  
discharge of batch.

5. V-BELT DRIVE — TORQUE ARM  
REDUCER . . . completely yet acces-  
sibly enclosed beneath base plate.  
V-Belt drive assures flexible operation  
. . . and easier, lower maintenance.  
Vertical mounted motor is readily ac-  
cessible for maintenance or removal.

6. REMOVABLE OR EXTENDABLE LEGS  
. . . standard legs are 12" long to  
provide a 33" desk high working  
height. The legs may be removed  
for table or other mounting . . . or  
extended to fit individual needs.

7. TORQUE ARM ADJUSTING NUT  
. . . permits exterior adjustment of  
V-Belt. An inspection plate (at rear)  
may be removed for visual adjust-  
ment or replacement of belt.

8. CRIB AND MULLER SCRAPERS . . .  
assures ease of cleaning, no "build  
up" of material, and are vital to  
many specialized mixing jobs. Inte-  
gral design of crib, turret and bed-  
plates also provides quicker, easier  
cleaning.

THE laboratory mortar and pestle has long been the world's  
"number one" method for establishing mixing standards and check-  
ing quality and efficiency. Your modern "mortar and pestle" is the  
new Simpson LF MIX-MULLER . . . with a special pair of revolving  
mullers and plows to provide the rubbing and smearing action that  
so thoroughly blends components into a uniform, inseparable mass.

Manufactured to the same exacting standards as the full line of  
larger Simpson MIX-MULLERS, the 24" pan diameter  
LF has all components—mullers, turret, crib, etc.  
. . . including batch capacity—scaled down propor-  
tionately. It provides a simple, extremely accurate  
working duplication of production mixing, for both  
laboratory and pilot plant service.

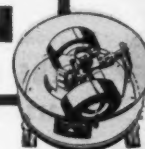
Bring modern "mortar and pestle" accuracy to  
your laboratory mixing. Consult a National engi-  
neer today.

Write for Bulletin 515.



**SIMPSON MIX-MULLER® DIVISION**

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.  
(Not Inc.)



When inquiring check CP 7972 on handy form, pgs. 2-3



# SHEET METAL FABRICATING • SHEET PLATE WORK • WELDMENTS LARGE STAMPINGS

*Complete Fabricating and Assembling  
Facilities for any type, size and  
quantity of sheet and plate products  
and weldments thru 3/8" thickness.*

## SPECIAL DEPARTMENT FOR SMALL JOBS AND PILOT WORK

**FACILITIES AND EXPERIENCE AVAILABLE  
FOR THE FABRICATION OF STAINLESS,  
MONEL, ALUMINUM AND OTHER ALLOYS.**

- **POWER PRESS BRAKES**—to 16'-10" long, 400 tons.
- **PRESSES**—to 48" x 84", 250 tons.
- **ALL TYPES WELDING EQUIPMENT**—Spot, Seam, Hellarc, Automatic and Manual Arc.
- **SEAM WELDERS**—to 200 K.V.A.
- **ASSEMBLY FLOOR CRANE CAPACITY**—to 25 tons.
- **LARGE STOCK**—Sheet, Plate and Structural
- **FACILITIES AND MATERIALS AVAILABLE FOR PROMPT SERVICE**

*Your Inspection Invited*

*Ask for brochure of plant and products.*

**WRITE OR PHONE FOR COMPLETE INFORMATION**

**THE KIRK & BLUM MANUFACTURING CO.**

3133 FORRER ST. (OAKLEY) CINCINNATI 9, OHIO

PHONE ELMHURST 1400

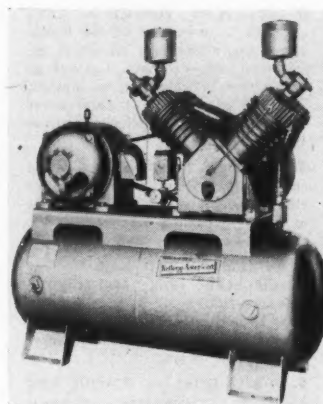
When inquiring check CP 7973 on handy form, pgs. 2-3

## MAINTENANCE

### Add 15 and 20 hp units to compressor line

Addition of Model BD461A (15 hp) and Model BD461B (20 hp) air compressors to present line has been announced by manufacturer. These models extend line from 1/3 to 20 hp with displacements to 105.9 cfm.

Of "V"-type construction, these four-cylinder, two-stage compressors are available in 22 models to cover a wide range of applications.



Model BD461A, tank-mounted unit illustrated, features dual controls which permit either automatic start-stop operation for intermittent use, or automatic intake loader operation for use where air demand is constant.

(Air compressors are products of Kellogg Div., American Brake Shoe Co., Dept. CP, 97 Humboldt St., Rochester, N. Y. . . . or for more information check CP 7974 on handy form, pages 2 and 3.)

### Illustrates tanks and hoppers

Four-page bulletin illustrates manufacturer's line of metal equipment for processing chemicals and pharmaceuticals. Included are trays, storage bins, containers, hoppers, tanks, laboratory stills, trucks, and inspection tables.

"Metal Equipment" is issued by Glasco Equipment Corporation, Dept. CP, 2 Wait Street, Paterson 4, N. J. When inquiring specify CP 7975 on handy form, pages 2 and 3.

## NOW YOU CAN HAVE METERED SURETY IN HANDLING CORROSIVE LIQUIDS

### All Stainless Steel Meter



### CONTROLS FORMULAS, COSTS, INVENTORIES

Rockwell Model 2-BC stainless steel meters provide indisputable records for the quantities of corrosive liquids used in mixing formulas. They provide basic accounting facts for accurate cost identification; for inventory controls; for tax analysis purposes.

These meters are constructed inside and out of stainless steel. Rated capacity 100 gpm. Quantity control registers and electrically actuated remote registration systems are available. Described in bulletin OG-403. Write Rockwell Manufacturing Co., Dept. A-5403 Pittsburgh 8, Pa.

Rotocycle meter, cut away to show the oil-revolving rotor construction.

YOU CAN RELY  ON ROCKWELL

## ROCKWELL INDUSTRIAL METERS

When inquiring check CP 7976 on handy form, pgs. 2-3

## NO RODDING NECESSARY!



### Strahman RAM TYPE Drain Valves

**The Only Drain Valve  
That Cannot Clog Up!**

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

Full  
Specifications  
on  
Application

**STRAHMAN VALVES, INC.,** 16 HUDSON STREET, NEW YORK 13, U.S.A.

When inquiring check CP 7977 on handy form, pgs. 2-3

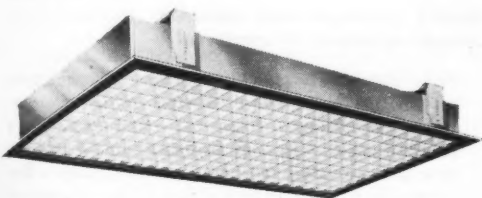
CHEMICAL PROCESSING

### Adaptability of light source promoted by use of module units

**Uses:** As a "large area" light source for interiors.

**Features:** Modular feature makes unit readily adaptable to such ceiling systems as the suspended grid, as well as for standard joist mounting or plaster frame mounting. When installed in suspended grid ceilings, fixtures are supported directly by runners. Pivot straps are provided at four corners of fixture body for those installation conditions which require them to be suspended also from overhead ceiling structure. Fixtures are easily coupled in continuous rows, without extra parts, in any standard mounting method.

**Description:** Fixtures, designated 3600 series, are constructed of heavy gage metal in modules of 2 x 2', 2 x 4', and 2 x 8'. They lend themselves to various patterned arrangements.



Fixtures are easily coupled in continuous rows

This lighting series is available for four to eight fluorescent single-pin or bi-pin lamps. Four, six and eight lamps are standard. Selection of diffusing elements consists of either metal louver with 32° shielding, ribbed glass, or molded plastic panels which are supported in piano hinged frames equipped with positive acting, snap-lock latches. All units are painted in baked white enamel having a reflectance of 86% or better.

(Lighting fixtures are products of Sunbeam Lighting Co., Dept. CP, 777 East 14th Place, Los Angeles 21, Calif. . . . check CP 7978, pages 2 and 3.)

### Engineering data tables contained in welded pipe and tube catalog

Illustrated 24-page catalog covers line of large diameter, corrosion-resistant pipe, tubing, and welding fittings. Sections are included on special metals and alloys, grades and finishes, size and length tables, weight tables, standard tolerances, and dimensional charts.

Engineering data tables cover corrosion-resistances of nickel alloys, chemical and physical properties of alloys, pipe flow data, fluid flow friction losses, beam formulas, mitered elbow dimensions, bolt strength and ASTM specifications.

Pipe engineering data book is issued by Stainless Welded Products, Inc., Dept. CP, 251 Cornelson Ave., Jersey City 2, N. J. When inquiring specify CP 7979 on handy form, pages 2 and 3.

## More Uniform Filtration and Diffusion with

ENGINEERED **R** PRESCRIBED

### NORTON POROUS MEDIUMS

Many filtering and diffusion processes throughout industry are efficiently accomplished with Norton ALUNDUM\* Porous Mediums. These include filtration, filtration with filter aids, under-drain systems, and gas diffusion applications.

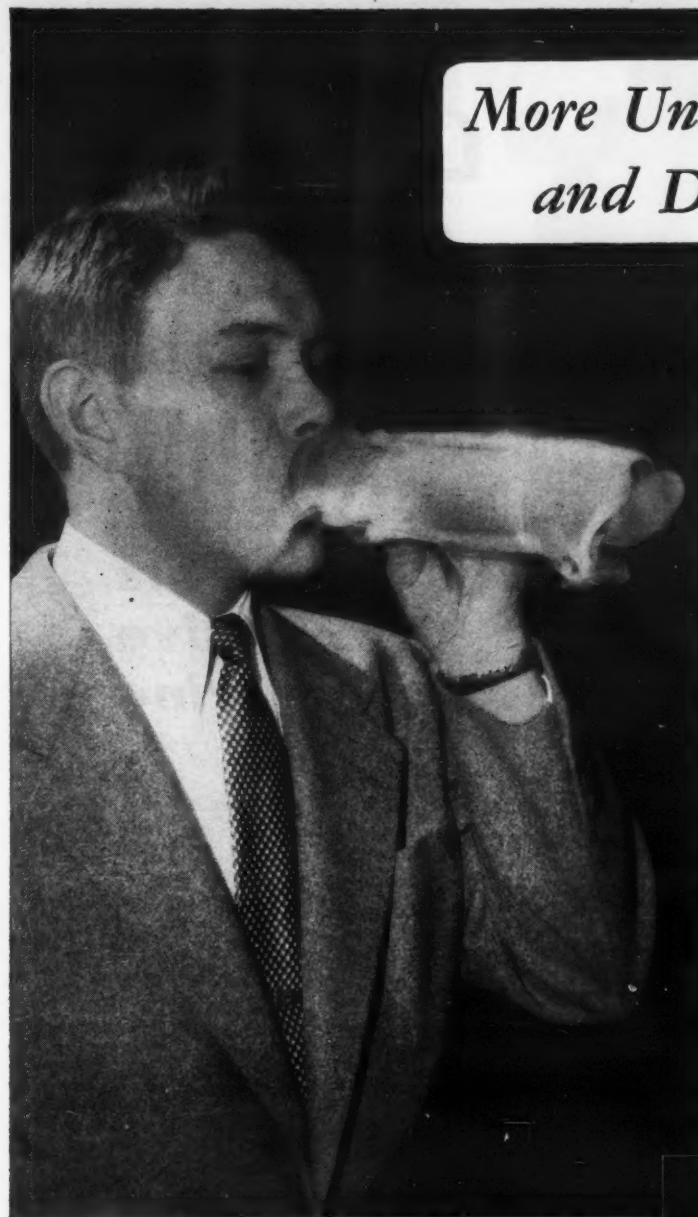
Uniformity of flow, ease of installation and cleaning, and resistance to attack of most industrial chemicals make them particularly suitable for chemical processing.

Even distribution of like pores throughout every plate and seamless tube made by the Norton Controlled Structure Process assure uniform flow and constant flow rate.

ALUNDUM porous plates and seamless tubes are available in a variety of sizes and permeability ratings. Chances are you can handle your filtering and diffusing processes more economically with these products.

### For further information

Contact your Norton representative or write for free booklet Form 140, to NORTON COMPANY, 563 New Bond Street, Worcester 6, Massachusetts. Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.



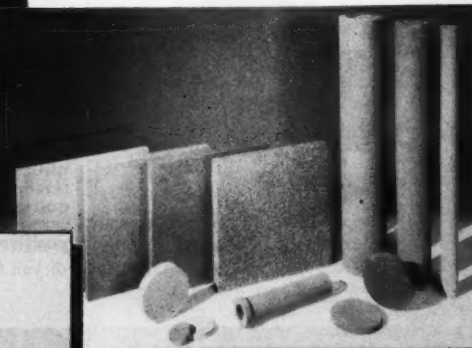
**SMOKE BLOWN THROUGH** a Norton ALUNDUM seamless tube escapes evenly throughout the tube's entire area. Such a tube gives most efficient filtration and ease of cleaning by back washing. When selecting tubes for your specific application be sure they embody this important feature.

\*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

**NORTON**  
**POROUS MEDIUMS**

ENGINEERED **R** PRESCRIBED

NORTON COMPANY, WORCESTER 6, MASSACHUSETTS



NORTON ALUNDUM POROUS MEDIUMS are available as tubes, plates and discs in a wide range of sizes and pore diameters.

When inquiring check CP 7980 on handy form, pgs. 2-3





# 3-STAGE GRINDING

**prevents  
excessive  
shattering**

**THE ALLIS-CHALMERS** three stage roller mill increases yield by minimizing fines. Each progressively finer grinding is extremely gentle. There is no excessive shattering . . . no size-destroying impact. Granulations are uniform. The entire mill output is ready for further processing. Elimination of fines reduces costly reprocessing.

To meet the varying requirements of the

chemical industry, Allis-Chalmers roller mills are also made in one pair and two pair high. All are of the single-flow type. Two and three pair high mills are used when no separation is necessary between reductions. Roller mills are available with rolls of 9 and 10 inch diameters in 18 to 42 inch lengths. For complete information, see your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wis.

A-4214

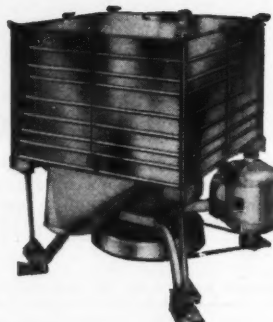
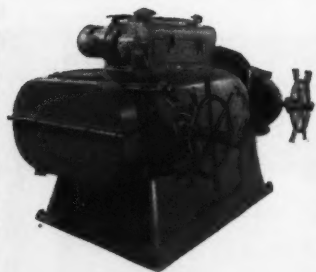
## FLAKING MILL

Pre-mill flaking is one of the many adaptations of Allis-Chalmers equipment and engineering in the chemical industry. By compacting your mill feed into broad surfaced flakes, the Allis-Chalmers flaking mill speeds subsequent grinding operations two to four times. Flakes shatter easier than other forms of material.

## Circle SIFTER

By utilizing stacked decks, the *Circle* sifter utilizes gyratory motion to provide the screen area of a single deck-type screen requiring four times the floor space. Flexible capacity, quick product changeover and positive tensioning are other advantages.

*Circle* is an Allis-Chalmers trademark.



# ALLIS-CHALMERS

## Reduction and Separation Equipment



When inquiring check CP 7981 on handy form, pgs. 2-3

*New*

### Oxygen in catalytic cracking subject of bulletin

Bulletin explains important role played by oxygen during regeneration of catalysts whose activity has been reduced by deposits of carbon. Prevention of losses from overloading of cyclones and precipitators, and from increased compression costs, is outlined. Other advantages offered by continuously measuring oxygen content of regenerator flue gases are covered.

Bul AD-608 is available from Arnold O. Beckman, Inc., Dept. CP, 1020 Mission St., South Pasadena, Calif. When inquiring specify CP 7982 on handy form, pages 2 and 3.

### Handy stainless steel selector speeds up choice of material

Slide rule chart quickly answers the question of what type of stainless steel to use in particular situations. Front of chart contains a comparison of physical and mechanical properties, and elevated temperature properties. Reverse side gives a large number of the important characteristics. The chart is designed for those who do not have metallurgical training.

Chart is available from Crucible Steel Company of America, Dept. CP, Box 88, Pittsburgh 30, Pa. When inquiring specify CP 7983 on handy form, pages 2 and 3.

### Complete line of lab ovens described in bulletin

Bulletin lists and describes complete line of manufacturer's laboratory ovens. Summarizes basic studies in heat transfer that led manufacturer's engineers to design a uniform-temperature apparatus heated by its own aluminum walls.

Bul FS-230 is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 7984 on pages 2 and 3.

### High impedance input recorder explained in bulletin

Data sheet describes high impedance input strip chart recorder which can be used with source impedances varying from 0 to 50,000 ohms without serious impairment of sensitivity, speed of response or damping.

Data Sheet 10.0-14 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Station 64, Wayne and Windrim Avenues, Philadelphia 44, Pa. When inquiring specify CP 7985 on handy form, pages 2 and 3.

## Literature

### Typical reactions and properties of fumaric acid reviewed

Properties of its products as well as typical reactions of fumaric acid are abstracted in eight-page technical bulletin. Addition and esterification products of possible application in such fields as paints, paper coatings, organic pigments, rubber, plastics and adhesives are discussed.

Bul 0-102 is available from Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 7986 on handy form, pages 2 and 3.

### Conductivity tester and uses explained in bulletin

Illustrated 4-page bulletin explains instrument for measuring conductivity of floors, personnel and equipment at locations where static electricity may be hazardous. Methods of conducting NFPA tests with instrument are included in the 3-color brochure.

Bul 2B is issued by Associated Research, Inc., Dept. CP, 3758 W. Belmont Ave., Chicago 18, Ill. When inquiring specify CP 7987 on convenient slip, pages 2 and 3.

### Tells how to avoid accidents in using hose couplings

Eight-page booklet relates how improper attaching of couplings to hose or mis-application are frequent causes of serious accidents or costly delays and interruptions. A number of safety "don'ts" as applied to couplings and hose are discussed and illustrated.

"Danger Under Pressure" is issued by Hose Accessories Co., Dept. CP, 2700 N. 17th St., Philadelphia 32, Pa. When inquiring specify CP 7988 on handy form, pages 2 and 3.

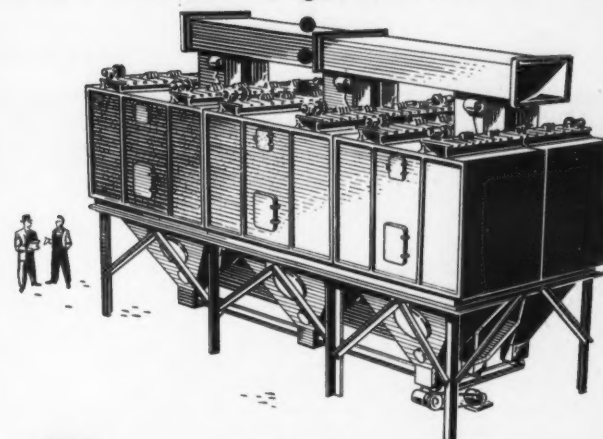
### Describes one-man handling of large appliances

Illustrated 4-page catalog outlines use of two wheel hand truck which embodies hydraulic lift capable of raising 500 lb loads. Safe handling of major appliances can be accomplished by one man with truck. Applications, specifications, and different models are covered.

Bul "Grand Shop Caddy" is issued by Allied Mfg. & Sales Co., Dept. CP, 201 N. Wells St., Chicago 6, Ill. When inquiring specify CP 7989 on convenient Reader Service slip, pages 2 and 3.

## DUST RECOVERY AT CLIMAX . . . . . A JOB FOR

# GIANTS!



**A**t the Climax Molybdenum Co., Langeloth (Pa.), the complete recovery of product fines presented no ordinary dust problem. Filters which would be veritable giants were needed to control ferromolybdenum fumes—tough to handle because of their light weight and voluminous characteristics.

To solve Climax's problem, Draco custom-engineered an entirely new Draco Dust Control System—the extremely rugged "DH" Filter. Designed for continuous, automatic service, these Draco giants operate under heavy-duty conditions.

At Climax, twelve Draco "DH" Filters with a capacity of 60,000 CFM are integrated with process equipment used in the manufacture of metallurgical compounds. While operating only intermittently, they capture some one-and-a-half tons per day of valuable ferromolybdenum fumes. All reclaimed materials are returned directly to process for re-use.

Whether your dust control or recovery problem is complex or simple, rely on Draco for the profitable, engineered-for-efficiency solution. Call in a Draco engineer today!

## DRACCO CORPORATION

4070 East 116th Street

Cleveland 5, Ohio

*Dracco Bulletin 800 contains complete technical information on "Industrial Dust Control and Recovery". Write for your copy today.*

Intake manifold for 60,000 CFM  
Dracco "DH" Filter System handles  
heavy dust load from pot furnaces.

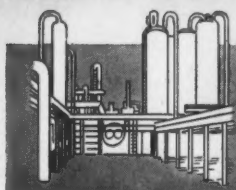
# DRACCO

*Performance Proved*

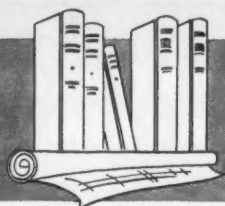
## Airstream CONVEYORS • DUST CONTROL EQUIPMENT

When inquiring check CP 7990 on handy form, pgs. 2-3





# Processing and Engineering Data



76

## Enthalpies of Normal Paraffin Hydrocarbon Gases

By R. L. MOISON

E. I. du Pont de Nemours & Company, Wilmington, Delaware

Edited by D. S. DAVIS

Professor of Chemical Engineering, Virginia Polytechnic Institute

From published data<sup>1</sup>, Davis constructed a nomograph<sup>2</sup> for enthalpies of paraffin hydrocarbon gases between 0 and 500°F. It has been found that gage points of normal hydrocarbons fall in a straight line. They are spaced logarithmically by molecular weight. Nomograph given here is based on the earlier work, but has been redesigned to include molecular weights. It can thus be used for finding enthalpies of mixtures of hydrocarbon gases.

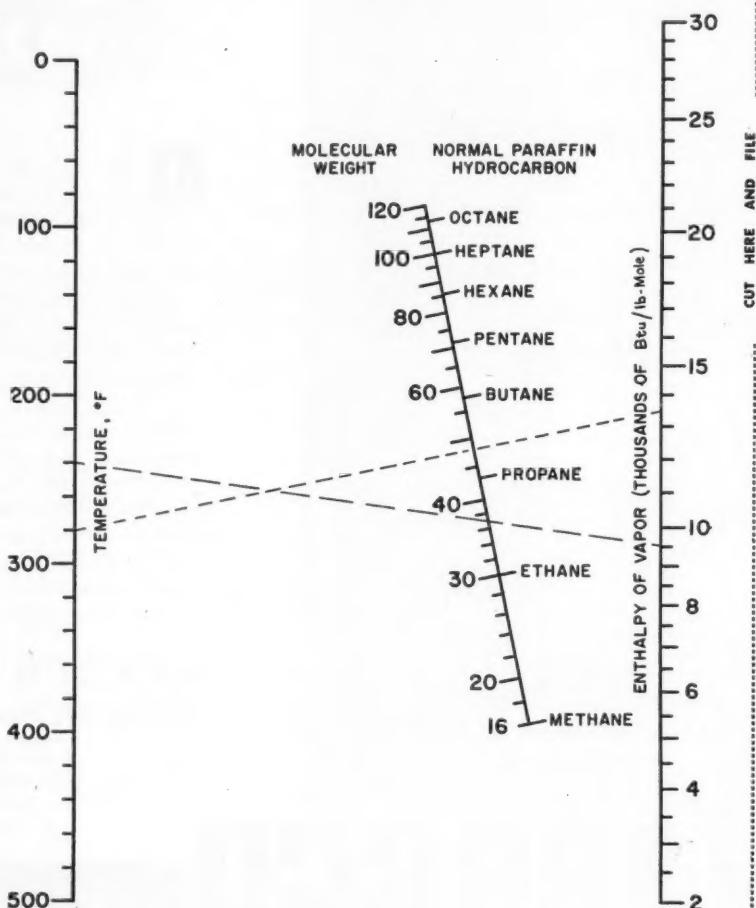
### Typical Examples

What is the molal enthalpy of a gas having equal parts (by volume) of ethane and propane at 240°F? Apparent molecular weight of the mixture is  $37 \dots (30 + 44)/2$ . Aligning 240°F with 37 on chart, enthalpy is shown to be 9500 Btu/lb-Mole.

What is the molal enthalpy of a gas containing 20(vol)% ethane, 30 (vol)% propane, and 50 (vol)% normal butane at 280°F. Molecular weight is  $0.2(30) + 0.3(44) + 0.5(58)$  or 48.2. Aligning 280°F on chart with 48.2 shows that 13,500 Btu/lb-Mole is the enthalpy.

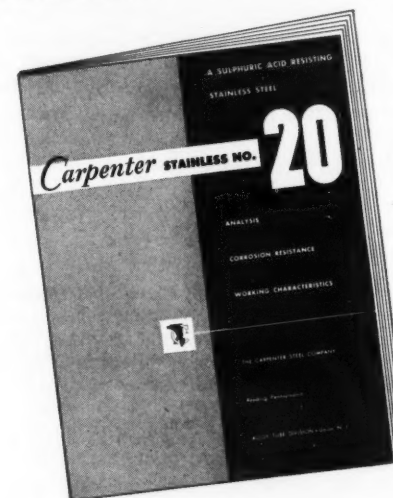
### LITERATURE CITED

- (1) BROWN, "Unit Operations," p 589, Wiley & Sons (1950)
- (2) DAVIS, *Chem Eng*, Vol 70, No. 8, p 200 (1953)



Trying to control Corrosion?

Send for technical data on Carpenter Stainless No. 20 tubing, pipe, sheet and plate—for Super Corrosion Control of  $H_2SO_4-HNO_3-H_3PO_4$ —and other strong corrosents.



This book contains information on analysis, corrosion resistance, fabricating characteristics, and physical properties, of all available forms of Carpenter Stainless No. 20 for extraordinary resistance to sulphuric acid and complete resistance to many other strong corrosive agents. If you have a severe corrosion problem, write today to:

**THE CARPENTER STEEL COMPANY**  
Alloy Tube Division, Union, N. J.

When inquiring check CP 7991 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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**Performance of protective coatings  
in HCl atmosphere**

Detailed study of the performance of various protective coating systems in hydrochloric atmosphere is reported in eight-page bulletin. Results of field tests of eleven coating systems exposed up to 83 weeks under corrosive conditions are given. Tests were conducted by Kenneth Tator Associates, corrosion engineers and consultants.

Bul RA 5167 can be obtained from Gates Engineering Co., Dept. CP, 100 S. West St., Wilmington, Del. When inquiring specify CP 7992 on handy form, pages 2 and 3.

**Multi-channel amplifier system  
offers versatile service**

Unitized, multi-channel amplifier system is described and illustrated in 14-page bulletin. Unit offers extended carrier-amplifier range and increased data capacity, may be used with the following transducers: capacitance, inductance, reluctance, resistance, piezoelectric, and photoelectric. Details, specifications, and prices included.

Bul CEC-1403 is available from Consolidated Engineering Corp., Dept. CP, Pasadena 15, Calif. When inquiring specify CP 7993 on handy form located between pages 2 and 3.

**Describe automatic, heavy-duty  
time switches**

Heavy-duty time switches for automatic control of street lighting, store windows, signs, other industrial applications, are described and illustrated in two-color, eight-page bulletin. Design, operation, application, dimensions, and pricing data are included.

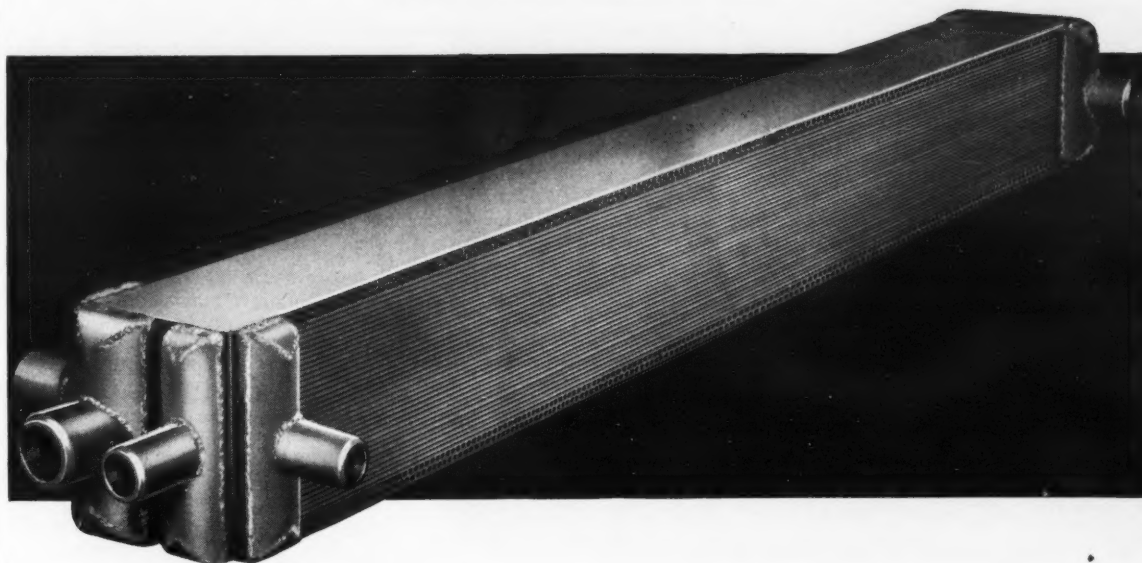
Bul GEC-535C is issued by the General Electric Co., Dept. CP, One River Road, Schenectady 5, N.Y. When inquiring specify CP 7994 on handy form, pages 2 and 3.

**Tells features, applications  
of optical pyrometer**

Illustrated, two-color catalog describes self-contained, direct-reading optical pyrometer in eight pages. Maker's line of pyrometers is listed, giving complete specifications, other pertinent data.

Cat 85, Pyro Optical Pyrometer, is issued by The Pyrometer Instrument Co., Inc., Dept. CP, Bergenfield, N. J. When inquiring specify CP 7995 on convenient Reader Service slip, pages 2 and 3.

# How to take the plus cost out of minus temperatures even at **-350°**



In many applications, TRANE Brazed Aluminum Heat Exchangers have licked the problem of excessive cost in low temperature heat transfer. Fabricated entirely of aluminum, they take full advantage of aluminum's higher thermal conductivity, its improved strength and high ductility at low temperatures. This, plus the inherently higher performance characteristics of the TRANE Brazed Aluminum Surface design, produces a heat exchange unit that is lighter, more compact, far more efficient—and far less costly—than conventional equipment.

In many instances, TRANE Brazed Aluminum Heat Exchangers have taken only *one-third* the space, weighed only *one-fourth* as much, as conventional exchangers. Yet, for all their light weight and compactness, these rugged units have the ability to operate at working pressures up to 450 lbs. p.s.i. at lowest temperatures.

Because of their economy, and because of their

ability to operate dependably at temperatures as low as -350 degrees and still pack as much as 450 square feet of surface into a single cubic foot of lightweight space, TRANE Brazed Aluminum Surfaces are ideally suited for low temperature applications such as ammonia, oxygen, helium, nitrogen and argon processing.

For that matter, TRANE Brazed Aluminum should be your first consideration for any difficult heat transfer application requiring *close temperature* approaches, *multi-stream* exchange, or *low temperatures*.

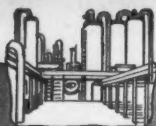
If you have a heat transfer problem, now is the time to call in TRANE. Our 30 years' experience in various types of heat transfer, and our engineering facilities, are always at your disposal. And for your files, get your copy of "Extended Surface Heat Transfer Equipment," showing the wide range of design possibilities. Simply contact your nearest TRANE Sales Office or write to TRANE, La Crosse, Wis.

## TRANE brazed aluminum heat transfer surfaces

The Trane Company, La Crosse, Wis. • East. Mfg. Div., Scranton, Penn. • Trane Co. of Canada, Ltd., Toronto • 87 U.S. and 14 Canadian Offices.

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT





## ROTAMETER CALCULATION METHODS

Taken from

"BROOKS ROTAMETER HANDBOOK"\*

BROOKS ROTAMETER COMPANY, Lansdale, Pa.

Despite rapidly advancing rotameter technology, practical problems of size selection, determination of actual flow, and flow correction still present formidable calculations. A new approach to these problems, handbook reviewed here contains tables and graphs of "precalculated" values — which actually correspond to test results. Thus complicated rotameter problems can be broken down to simple steps, factors found for the solution to each step, and final answer arrived at by simple multiplication.

### Typical Examples

While methods presented cover practically all rotameter problems falling below the viscosity immunity ceiling, only two — a flow correction problem and a sizing method — are shown here.

\*Copyright 1953 by Brooks Rotameter Company. Portions reproduced here by permission of the copyright owner.

SIZE SELECTION AND FLOW CORRECTION FACTORS FOR GASES OTHER THAN AIR				
Gas	Size Req. Factor	Actual Flow Factor	Density lbs. cu. ft. at 70° 14.7 PSIA	Spec. Value Cu. ft. per lb. at 70° 14.7 PSIA
Air	.952	1.04	.075	14.70
Acetylene	1.000	1.00	.075	13.34
Ammonia	.769	1.30	.044	23.6
Argon	1.18	.849	.103	9.68
Butane (n)	1.44	.695	.1145	8.74
Carbon Dioxide	1.34	.806	.0725	13.8
Carbon Monoxide	1.02	.933	.0785	12.73
Chlorine	.984	1.02	.0725	13.1
Ethane	.372	2.69	.0103	96
Ethylene	1.13	.885	.0052	192.5
Hydrochloric Acid	.263	1.34	.0415	10
Hydrogen	.745	.980	.1304	152.5
Methane	1.32	.758	.0775	10
Methyl Chloride	1.02	.980	.0725	10
Nitric Oxide	.984	1.02	.1140	10
Nitrogen	1.23	.827	.1170	10
Nitrous Oxide	1.05	.952	.1700	10
Oxygen	1.25	.801	.1700	10
Propane	1.51	.661	.1700	10
Sulfur Dioxide	2.35	.425	.1700	10
Bromine	2.70	1.85	.605	10
Chloroform Vapors	1.65	1	.605	10
Hydrobromic Acid				

Any Gas or Mixture	Sp. Gr. VS Air = 1.000	VS Air = 1.000

Temp. °F	Size Req. Factor	Actual Flow Factor	Temp. °F	Size Req. Factor	Actual Flow Factor
-50	.315	3.18	130	.375	2.69
-40	.312	3.14	120	.372	2.69
-30	.309	3.10	110	.369	2.69
-20	.306	3.07	100	.366	2.69
-10	.303	3.03	90	.363	2.69
0	.300	3.00	80	.360	2.69
10	.297	2.97	70	.357	2.69
20	.294	2.94	60	.354	2.69
30	.291	2.91	50	.351	2.69
40	.288	2.88	40	.348	2.69
50	.285	2.85	30	.345	2.69
60	.282	2.82	20	.342	2.69
70	.279	2.79	10	.339	2.69
80	.276	2.76	0	.336	2.69
90	.273	2.73	-10	.333	2.69
100	.270	2.70	-20	.330	2.69
110	.267	2.67	-30	.327	2.69
120	.264	2.64	-40	.324	2.69
130	.261	2.61	-50	.321	2.69
140	.258	2.58			

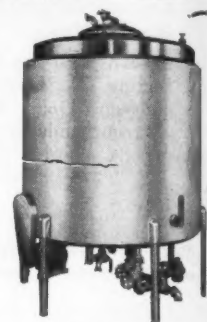
Figures taken from these tables (reproduced from Handbook) are used to solve problem shown on page 192

Chemical Processing, April 1954

## What's eating your stainless steel tanks?

For more than a quarter century Metal Glass Products Company of Belding, Michigan has specialized in the manufacture of stainless steel tanks for all phases of the processing industries. In that time they have come to know the advantages and limitations of stainless steel fabrications for industry.

The design engineers at Metal Glass realize that stainless steel is not the cure-all to corrosion and wear that many believe it to be. They know that there are many acids, salts and organic substances that will attack stainless steel tanks. They realize that special care must be taken in every step of installation and fabrication to keep their tanks unaffected when used with various liquids. The performance of the units in actual plant operation depends to a large extent upon the manner in which the installation was made and the daily treatment accorded the equipment.



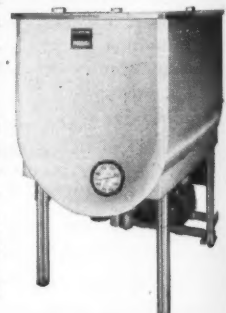
TYPE "CK"



TYPE "CJ"

For these reasons Metal Glass attempts to make every unit a custom built model. Even the standard items illustrated in this article are precision built. Despite the care exercised in building standard units, there are many applications that call for a specially designed piece of equipment. It is in cases like these that it pays to call on Metal Glass. Our engineers working with your personnel can develop a tank to meet your exact requirements. Our engineering department is set up and maintained to help you on your special tank problems. We welcome the opportunity to work with you.

In addition to experience in the specific characteristics of metals with reference to corrosion resistance, heat transfer and general machinability, we can offer you considerable knowledge in insulating materials, types of refrigerants and metalizing processes.



TYPE "CHR"

Write us today for assistance or consultation on your problem.

**STAINLESS STEEL SAN-I-TANKS**  
METAL GLASS PRODUCTS COMPANY

BELDING 11, MICHIGAN

DISTRICT OFFICES: New York • Chicago • Atlanta • Detroit  
Pittsburgh • Pasadena • Toronto

When inquiring check CP 7996 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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### Pneumatic weight transmitter outlined in catalog

Platform weighing scale with pneumatic transmitter for batch or continuous process control is described and illustrated in four-page, two-color catalog. Diagrams, graphs give capacities, dimensions, typical applications.

Cat 10 is issued by Weighing Components, Inc., Dept. CP, 64 Fulmor Road, Hatboro, Pa. When inquiring specify CP 7997 on handy form, located between pages 2 and 3.

### Shows laboratory equipment for petroleum testing

Six-page, illustrated bulletin covers manufacturer's line of petroleum testing apparatus. Detailed information is given on the following equipment: instrument for determining oil content in paraffin wax, an improved cover for Pensky Martens constant temp bath for testing API and sp gr of petroleum products, LPG vapor pressure bomb, turbine oil rust prevention apparatus, MacCoull corrosion tester, and twin unit apparatus for determining TEL content in gasoline.

"Labitem's" is issued by the Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N.Y. When inquiring specify CP 7998 on handy form, pages 2 and 3.

### Gas analyzers for lab, industry described in data sheet

Data sheet describes gas analyzers for laboratory and industrial use. Instruments are positive non-dispersion type infrared analyzers that are sensitive to ppm ranges.

Data Sheet 10.15-10 is issued by Minneapolis-Honeywell Regulator Co., Industrial Div., Dept. CP, Station 64, Wayne and Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 7999 on handy form, pages 2 and 3.

### Contains dimensional drawings of various filters

Stainless steel filters for free-flowing, light-to-heavy bodied liquids are specified and illustrated in four-page bulletin. Photographs and dimensional drawings depict filters available. Tubular filters, pipe line filters, and vertical floor-mounted filters are included.

Bul 489 is issued by Cherry-Burrell Corporation, Dept. CP, 427 W. Randolph Street, Chicago 6, Ill. When inquiring specify CP 8000 on convenient Reader Service slip, pages 2 and 3.

Technical data on the revolutionary new

# holo-flite\*

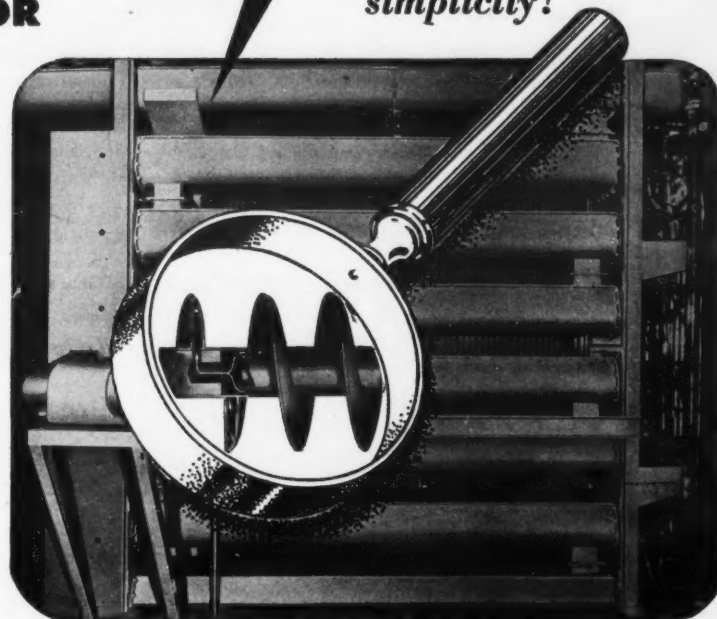
(HOLLOW-FLIGHT)  
PROCESSOR

If you have processing operations where slurries, solids, pulps or pastes must be cooled or cooked, be sure to investigate the many unique advantages of the newly-developed HOLO-FLITE Processor before you install any heat-exchange equipment.

### Here's the HOLO-FLITE principle...

Two or more screw conveyors rotate slowly in a trough. The blades and shaft of each flight of conveyors are hollow, with provision for circulating the heat-transfer agent through them. The product to be cooled or cooked is moved along the trough, being constantly rotated into, around, over and under the conveyor screws as it moves.

Thus, a continuous thermal transfer takes place between the product and the heat-transfer fluid circulating in the blades. The product is cooled or cooked in continuous-flow without the "stop-and-go" losses of batching operations... and cooled products can be packaged directly from the HOLO-FLITE discharge—saving space, time and additional handling.



THIS 6-TIER HOLO-FLITE cools 7 tons of cottonseed press cake per hour from 285° to 89° F. in a total floor space of only 28 sq. ft.  
(Inset) Enlarged cutaway view of HOLO-FLITE screw showing heat-transfer principle.

### Here are typical HOLO-FLITE advantages

The HOLO-FLITE principle is so unique it is setting completely new standards of performance in many ways. For example...

\*Reg. T.M.

**The HOLO-FLITE Saves Space**  
—It requires as little as 1/5th the space of other units of comparable capacity because (1) it has far greater heat-transfer area per cubic foot of space... and (2) the flights can be "tiered" as high as desired to give maximum capacity in very small floor areas.

**The HOLO-FLITE is Versatile**  
—Processed product can be fluid, pulp or paste—granular, crys-

talline or powdered solid. Heat-transfer fluid can be refrigerant, cooled or ambient water, steam, oil or any other desired fluid, at any normal temperature range.

**The HOLO-FLITE is Dust-Free**  
—Its gentle action provides large heat-transfer action without dust and with negligible particle abrasion. Simplifies installations, assures higher quality product.

**The HOLO-FLITE is Adaptable**  
—It can easily be designed to handle virtually any capacity by (a) varying the diameter of the screws (7" to 16")... (b) varying the length of the screws (8 ft. to 20 ft.)... (c) varying the number of intermeshing screws per trough (2, 4, or 6)... and (d) varying the number of tiers stacked on top of one another (1 to 10, or more).

The HOLO-FLITE is in daily operation on such typical products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods and many other equally-varied products.

**What is your problem?** Our engineers will be glad to assist you in making the most of HOLO-FLITE advantages. Write wire, or phone the office nearest you!

**Want More Facts?** This 8 page booklet describing the HOLO-FLITE in greater detail will gladly be sent on request. No obligation, of course.



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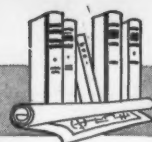
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When inquiring check CP 8001 on handy form, pgs. 2-3





## Processing and Engineering Data



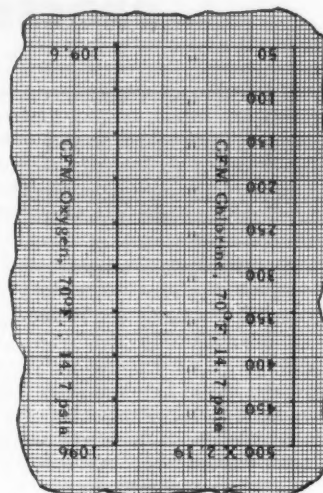
77b

### Rotameter Calculation Methods

#### Flow correction:

A rotameter with a factory calibration of 50 to 500 scfm of chlorine at 80°F and 40 psig is to be used for oxygen at 70°F and 100 psig. What will rotameter's scale readings mean in terms of oxygen?

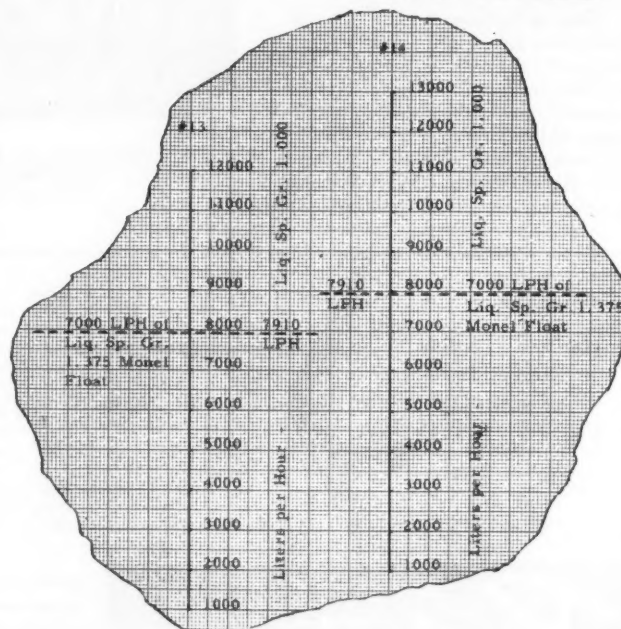
- Step 1: Referring to air as a standard, find Size Requirement Factor for air at 80°F, 40 psig in table ..... 0.523
- Step 2: Size Requirement Factor for chlorine from table ..... 1.576
- Step 3:  $500 \text{ cfm} \times 0.523 \times 1.576 = 412 \text{ cfm}$  as standard flow (air at 14.7 psia and 70°F)
- Step 4: Actual Flow Factor for air at 70°F, 100 psig is shown in table as .... 2.79
- Step 5: Actual Flow Factor for oxygen is shown to be 0.952 of air's ..... 0.952
- Step 6:  $412 \text{ cfm} \times 2.79 \times 0.952 = 1096 \text{ cfm}$  as actual flow of oxygen at 70°F and 14.7 psia<sup>1</sup>
- Step 7: Correction is then  $1096/500 = 2.19$



#### Sizing method:

A flow of 7000 liters per hour of sp gr 1.375 liquid. Corrosion dictates monel float and wetted metal parts. What size rotameter is needed?

- Step 1: Find Size Requirement Factor for monel float at sp gr 1.375 ..... 1.13
- Step 2:  $7000 \text{ l/hr} \times 1.13 = 7910 \text{ l/hr}$  "Standard Flow" units
- Step 3: Tables show that two rotameters meet specification
- 1250 to 12,500 l/hr Size 13, upper range
- 1360 to 13,600 l/hr Size 14, lower range
- Step 4: Select one of the two based on other problem considerations.



Handbook was one and one-half years in preparation. It contains more than 129 pages of tables, graphs and text. Special sections and chapters deal with liquids, gases, lab flow data, design data, operating instructions, float types, corrosion data, etc. Provision is made for supplementary information to be issued in the future.

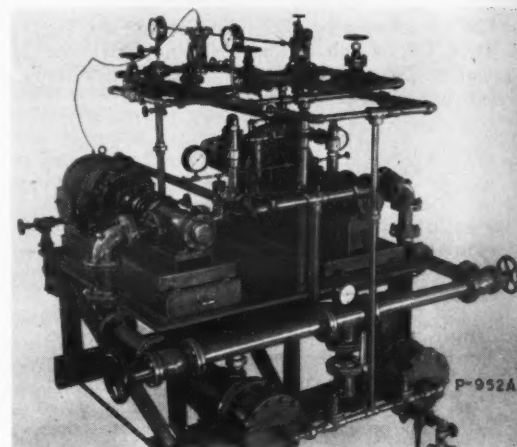
("Rotameter Handbook" (complete book costs \$20)

is published by Brooks Rotameter Co., Dept. CP, Lansdale, Pa. . . . or for more information check CP 8002 on handy form, pages 2 and 3.)

<sup>1</sup>Standard of comparison is "one cubic foot of gas at 14.7 psia and 70°F." Thus scale inscriptions may read "cfm of chlorine at 14.7 psia and 70°F, metered at 70°F and 100 psig."

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P-952A—Steam Turbine and Electric Motor drive gives flexibility in this compact Model P-ES2H size No. 25 unit.

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## FUEL OIL PUMPING AND HEATING UNITS

NATIONAL AIROIL Fuel Oil Pumping and Heating Units are specially designed to prepare, for combustion, all grades of fuel oil including No. 6 or Bunker "C" Oil and residuums. They will draw fuel oil from above ground or underground tanks, preheat it to proper constant temperature and deliver it to Oil Burners at an even pressure, best suited for the burners. Our Fuel Oil Pumping and Heating Units are the result of years of experience. They come completely equipped ready for steam, exhaust, condensate, oil suction, oil return, and electrical connections. All valves, regulators, etc., are readily accessible. The piping arrangement is easily understood. These compact, space-saving units are available in a range of sizes and models in both Medium and High Pressure types. For complete details, write for our Bulletin 40—very interesting and informative.

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STEAM ATOMIZING OIL BURNERS  
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DUAL STAGE, Combining Steam and Mechanical Atomization  
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AUTOMATIC OIL BURNERS, for small process furnaces and heating plants

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Southwestern Division: 2512 SOUTH BOULEVARD, HOUSTON 6, TEXAS

When inquiring check CP 8003 on handy form, pgs. 2-3

CHEMICAL PROCESSING

### Physical & chemical properties of 15 plastics studied

Brochure contains 25-page report on physical and chemical properties of 15 plastic materials. Each material is described in detail regarding its appearance, application, corrosion resistance, mechanical and physical properties. Chemical composition and temperature limitations are also considered.

"Plastics Equipment Reference Sheet" is available from The Atlas Mineral Products Co., Dept. CP, 26 Walnut St., Mertztown, Pa. When inquiring specify CP 8004 on handy form, pages 2 and 3.

### Gives lowdown on high-lift truck facilitating maintenance

Features of manufacturer's high-lift electric truck, the Lift-A-Loft, for speeding overhead maintenance jobs are described in 4-page bulletin. By controlling movements from his platform, maintenance man can raise himself and his tools to a 20' elevation. Truck travel and spotting the platform are also push-button controlled by operator.

Bul describing Lift-A-Loft unit is issued by the Barrett-Cravens Co., Dept. CP, 4609 S. Western Ave., Chicago 9, Ill. When inquiring specify CP 8005 on handy form, pages 2 and 3.

### Issues technical bulletin on polyvinyl chloride resins

Series of polyvinyl chloride resins and their applications are described in 6-page bulletin. Technical data bulletin includes graphs and tables on various properties of the material. Manufacturer supplies resins as unformulated powder for calendaring or extruding operations.

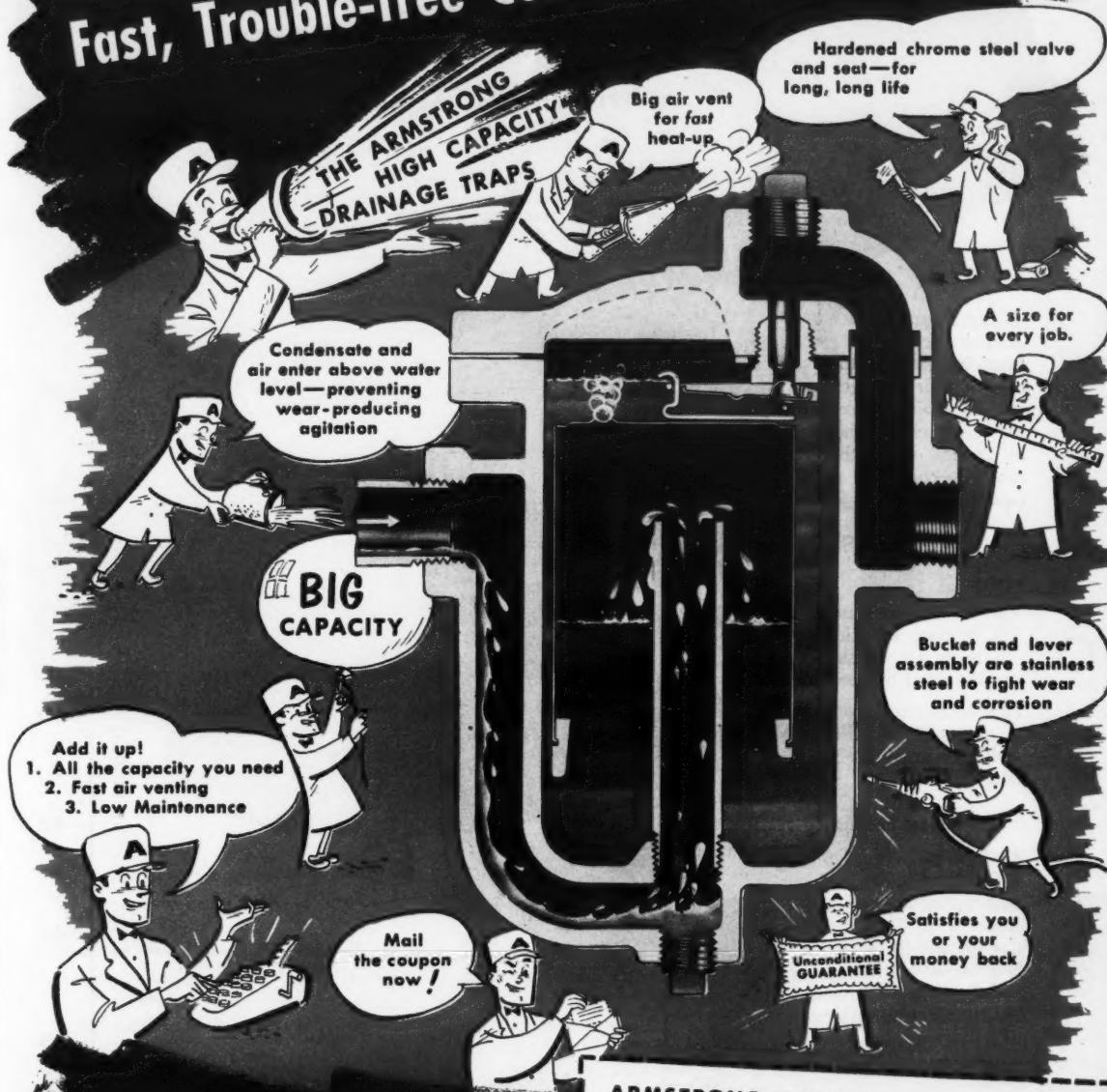
Bul PVC 100 is issued by the Dow Chemical Co., Midland, Michigan. When inquiring specify 8006 on handy form, pages 2 and 3.

### Physical properties and uses of trimethylol ethane listed

Physical properties and uses of trimethylol ethane (TME) are covered in 12-page bulletin. Discussed in detail is manufacture of synthetic drying oils and alkyd resins. TME is a solid trihydric alcohol. Chemical formula is  $H_3C(CH_2OH)_3$ .

Technical Data Sheet PE-10 is issued by Heyden Chemical Corp., Dept. CP, 342 Madison Ave., New York 17, N. Y. When inquiring specify CP 8007 on the convenient Reader Service slip located between pages 2 and 3.

## here is the means for Fast, Trouble-free Condensate Drainage



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When inquiring check CP 8008 on handy form, pgs. 2-3





## Relative Humidity Control with Sulfuric Acid

By D. S. DAVIS

Professor of Chemical Engineering  
Virginia Polytechnic Institute

Wilson's data<sup>1</sup> show that any desired percentage relative humidity can be attained by bubbling air through sulfuric acid of proper concentration. Between relative humidities of 25 and 65%, these data can be correlated by the equation

$$R = a + bS$$

where:

R = Relative humidity %  
S = conc of acid %  
a & b are constants determined by temperature

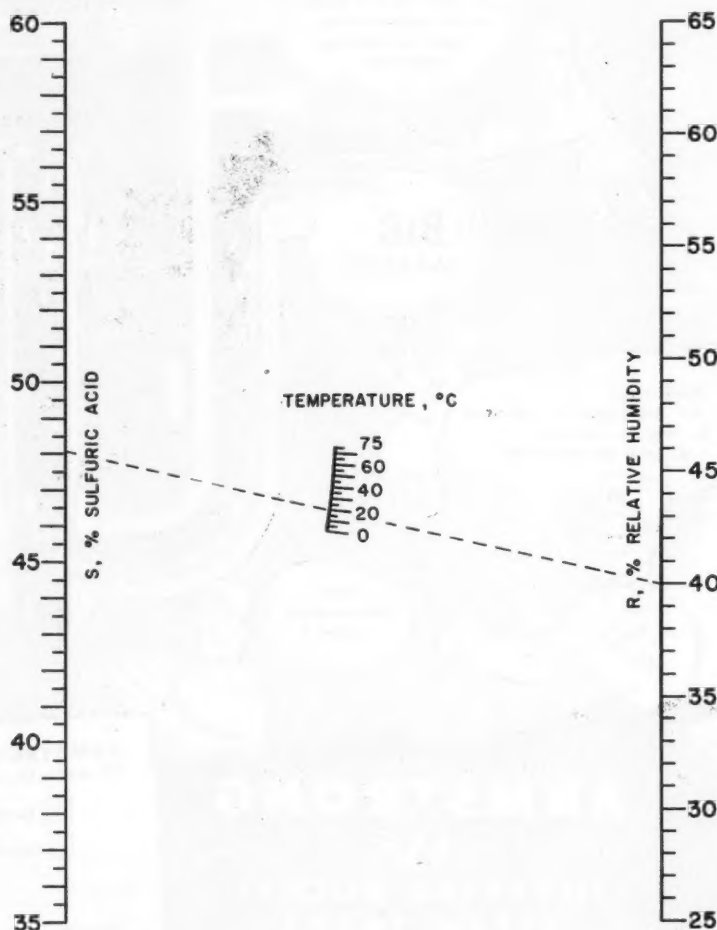
This nomograph, constructed by methods described previously<sup>2</sup>, is based on Wilson's data.

### Typical Example

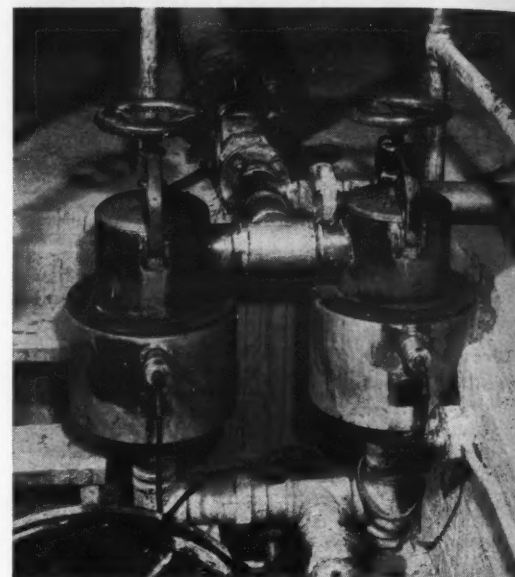
Air is to be bubbled through sulfuric acid to achieve a relative humidity of 40% at 20°C. What concentration of acid should be used? Connect 40 on the R-scale with 20 on the Temperature scale. This line intersects the S-scale at a concentration of 48.1% sulfuric acid.

### LITERATURE CITED

- (1) WILSON, R. E., *Ind Eng Chem*, Vol. 13, p 326, (1921)
- (2) DAVIS, D. S., "Empirical Equations and Nomography," Chapter IX, McGraw-Hill Book Co., Inc. (1943)



## This manufacturer "doubled the guard" to eliminate iron contamination

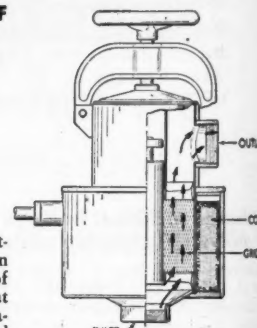


TWIN INSTALLATION OF

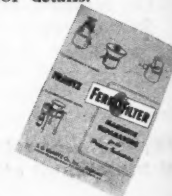
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### Magnetic Separators

has helped our customer, a pottery, increase casting production and also improve the quality of white ware. It is estimated that losses due to iron contamination, now negligible, would without FERROFILTERS amount to approximately 5%. Make sure you have this protection at all trouble spots to insure the removal of iron particles, rust and scale from slurries and other liquid suspensions. For complete information on types and capacities available . . . .



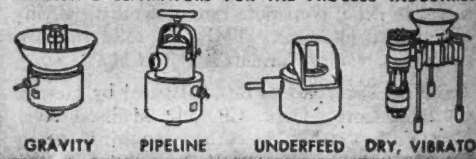
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When inquiring check CP 8009 on handy form, pgs. 2-3

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**Discusses mechanical rectifier unit substation**

Recently announced mechanical rectifier unit substation for providing DC power is covered in four-page bulletin. Text discusses and pictures illustrate design characteristics, installation procedure, and safety factors. Maintenance procedures and components of substation are described.

Bul GEA-6083 is issued by General Electric Co., Dept. CP, 1 River Rd., Schenectady 5, N. Y. Specify CP 8010 on handy form, which is located between pages 2 and 3.

**Pictorial history of ceramics highlighted in booklet**

Outstanding ceramics since prehistoric times are featured in 32-page booklet. These products are pictured in color, described in detail, and an analysis of their constituents is given. Material is included on uses and advantages of alumina in ceramics.

"Ceramics and Man Through the Ages" is available to members of the ceramic and allied industries on letterhead request to Chemicals Div., Aluminum Company of America, Dept. CP, 774 Alcoa Bldg., Pittsburgh 19, Pa.

**Shows line of hydraulic four-way valves**

Four-page bulletin illustrated in two colors features line of electrically actuated hydraulic four-way valves.

Valves are small, lightweight, feature no mechanical linkage. They are used in control systems requiring high accuracy, such as machine tools, and paper-making and textile machinery.

Bul 500 is issued by the Moog Valve Co., Inc., Dept. CP, Proner Airport, E. Aurora, N.Y. When inquiring specify CP 8011 on handy form, pages 2 and 3.

**Bulletin on electric hoists describes 17 models**

Illustrated 6-page bulletin presents performance and safety features, cut-away drawings showing details of construction, and complete specifications for 17 electric hoist models from 500 to 4000 lb capacities. Also pictured and described are various electric hoist accessories.

Bul QL is available from Coffing Hoist Co., Dept. CP, 800 Walter St., Danville, Ill. When inquiring specify CP 8012 pages 2 and 3.



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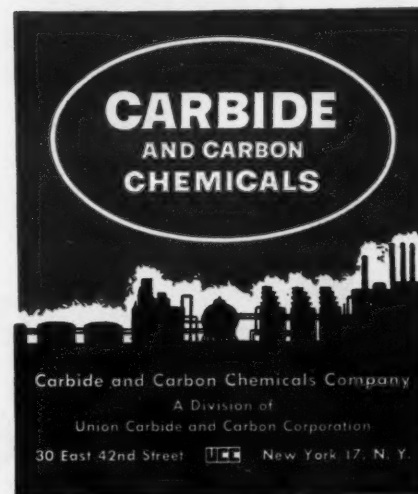
**TERGITOL Anionic 4**—for moderately concentrated solutions of acids, alkalies, and salts

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When inquiring check CP 8013 on handy form, pgs. 2-3



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By equipping every Q.C.F. Lubricated Plug Valve with the new Teflon Gasket, we have lengthened service life while improving operation.

You get greater protection against head leakage...trouble-free operation in temperatures up to 450° F. Greatly reduced turning torque.

What's more, this new gasket—tested in the field for four years under the most exacting conditions—is a discovery that can mean substantial savings in time and money. Investigate today! See your Q.C.F. Representative for the complete facts.

#### Gasket characteristics:

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- can't bind
- unique shape maintains lubricant release
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Round Port Valves—100% Obstruction Free • Rectangular Port Valves with Full Pipe Area • Venturi Valves for Economy



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## PLUG VALVES

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## UNIT OPERATIONS

(Continued from page 5)

of chemistry, physics, and engineering, combined with mathematical correlation and interpretation of data. Where fundamental concepts have not been fully developed, empirical methods are used. This same analytical approach can be applied in pilot plant studies.

When the fundamental approach appears to be the better method, equipment is specifically designed to yield data in a form which is readily amenable to analysis and correlation in terms of these fundamental principles. When reactions of the process are complex it may not be possible to correlate information solely on the basis of fundamentals. Hence it may be necessary to rely on the empirical approach for analyzing and correlating data. Engineers, however, must realize that this approach is rapidly becoming outmoded. More and more the engineer must put forth a real effort to obtain and correlate his information in terms of fundamental principles. Greater progress in process development work will result from wider application of the fundamental approach.

Keeping in mind these points, application of fundamental principles should start right at the beginning of a study, i.e., design of the pilot plant. The latter is designed to facilitate the study of problems to be solved. These problems are divided into groups according to processing steps, and are set up so that they are related to one or more processing steps which can be studied independently of each other. Such a division generally results in the pilot plant being composed of several small pilot units, each representing a different part of the process. Thus, the actual apparatus which is to be used for a particular processing step can be designed for greater flexibility and thereby it is not limited by operations of other parts of the process.

Using this course of action, pilot plants will not, as a general rule, be replicas of the proposed commercial installation. The major pilot unit should be designed to study in detail the most critical processing step or steps in the total operation. In catalytic processes this is generally the catalytic reaction step. Here a detailed knowledge of the effect of operating variables on yield and quality of products is of prime importance. There are, however, definite limitations concerning the information which can and should be obtained from the pilot unit. In many cases, a great deal of important supplemental information can be obtained more economically and accurately in small bench scale equipment.

For design and operation of process equipment, precise knowledge of heat effects in any processing step should be known. One of the major contributors to over-all heat effect is the heat of reaction. Determination of heat of reaction by actual heat balances around the pilot unit usually results in values having a large error. Such errors are introduced because heat of reaction is obtained by differences between total heat quantities which have errors that are large in relation to heat of reaction.

To design the pilot unit so that heat of reaction may be obtained by a heat balance would require exceedingly high expenditures. It is much more satisfactory

When inquiring check CP 8014 on handy form, pgs. 2-3

to make use of modern calorimetric apparatus and techniques which are known to give results of high precision. It is only necessary to determine experimentally the heats of combustion of reactants and products taken from any given pilot unit run. By combining these data with accurate sensible heat data, heat effects may be calculated directly.

Other examples of typical studies which can more economically be carried out on small scale equipment are catalyst aging, catalyst activity and selectivity, corrosion, heat transfer, fluid flow, and solid flow.

These considerations indicate that the often heard lament, "If we only had a large pilot plant, all our problems would be solved," is not necessarily justified. Large pilot plants which are replicas of the proposed commercial unit are very inflexible. Furthermore, the cost of building and operating a large pilot plant is high. Finally, excessive expenditures are involved in obtaining all data required and data obtained may not be sufficiently accurate for design purposes. This indicates that more useful data can be obtained at less expense by carrying out process development studies in relatively small pilot units supplemented by investigations on independently operated small bench scale equipment. By using this approach, pilot plant studies should continue to be justified on an economical basis.

#### **Descriptive data offered on adenylic acid**

A growth requirement for certain microorganisms, adenylic acid, the nucleotide present in yeast nucleic acid, has been investigated for its physiological effects. Reports on these and other data on the acid are included in recent bulletin. Bibliography supplements text.

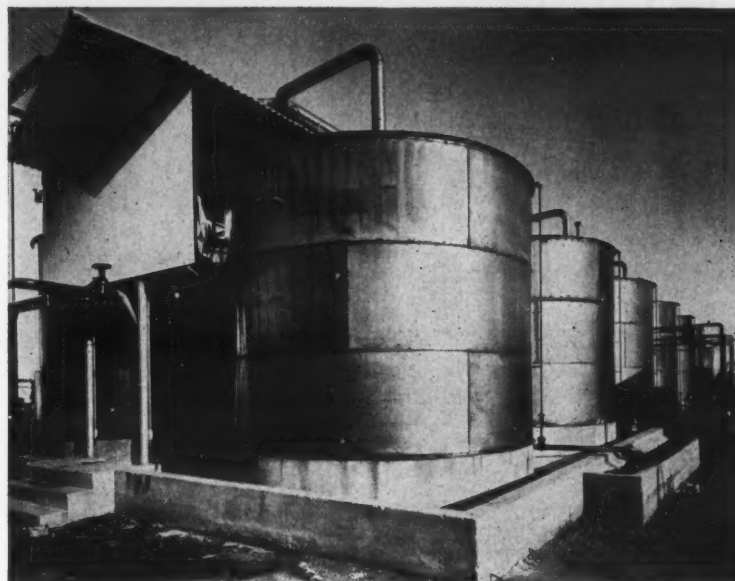
Bul 106b is issued by Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mount Vernon, N.Y. When inquiring specify CP 8015 on handy form, pages 2 and 3.

#### **Features of hand and electric hoists outlined in 12-page booklet**

Twelve-page booklet is illustrated to show most suitable hoist for the "big" job, the "specialized" job, the "occasional" job, and "every" job. Other illustrations show features of manufacturer's hoists.

Differential screw gear and spur-gear hand hoists are compared for relative efficiency and initial costs. Also shown in booklet are typical applications for a versatile tool which can be used for either pulling or for lifting jobs.

"There's a Yale Hoist for Every Lifting Job," is issued by Materials Handling Div., The Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia, Pa. When inquiring specify CP 8016 on handy form, pages 2 and 3.



Some of the 24 Monel Twitchell splitting vessels installed by the Southern Cotton Oil Company. These tanks have been in service four years and have required minimum maintenance. Approximately 120,000 pounds of 0.125" sheet Monel was used to fabricate the self-supporting fat-splitting tanks.

These fat-splitting tanks

## **ended leakage—ended caulking**

... for Southern Cotton Oil Company

After four years, the Southern Cotton Oil Company is still getting excellent service from those tanks—but that's just what you would expect of Monel®!

The Twitchell splitting vessels they had used previous to Monel had often required attention involving caulking of riveted joints and repairing at the seams to prevent leakage.

With the welded Monel tanks they have had none of this expensive and time-consuming maintenance.

And there is good reason why they are so pleased with their installations.

In addition to being highly resistant to hot corrosives encountered in Twitchell splitting, their Monel vessels do not introduce undesirable metallic contamination... an important consideration with

today's standards of product purity.

As a fabricating material, Monel offers important mechanical advantages, too. It is stronger than structural steel, hard, tough, yet ductile enough to permit easy forming and machining. Monel can be joined by soldering, brazing, or welding, and welds in Monel are as corrosion-resistant as the alloy itself.

Prominent manufacturers of stearic acid, red oil, glycerine and allied chemicals report service records up to eleven years for Monel tanks and heating coils.

For help with problems connected with the manufacture and handling of fatty acids, remember you can always count on Inco's Technical Service and Corrosion Engineering Section. Write them today.

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## **Inco Nickel Alloys**

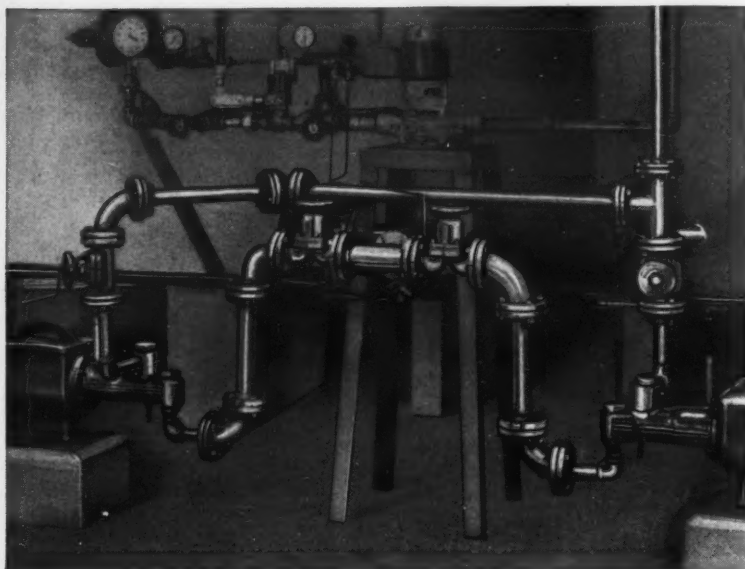
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When inquiring check CP 8017 on handy form, pgs. 2-3



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Large Southeastern Paper Mill Uses Saran Lined Pipe,  
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SP11618

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We'll be glad to assist with your installation plans. Write or call the SARAN LINED PIPE COMPANY, Ferndale 20, Michigan, or contact our nearest sales representative.

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When inquiring check CP 8018 on handy form, pgs. 2-3

## NEW LITERATURE

### Solvents chart stresses safety factor

Complete physical specifications of eight solvents "engineered for safety" are shown on single data chart. Products data, suggested uses, and other information are included.

Bul CD is issued by John B. Moore Corp., Dept. CP, P. O. Box #3, Nutley 10, N. J. When inquiring specify CP 8019 on pages two and three.

### Gives up-to-date review of chemical literature

Literature on products being offered by firm for trial use is reviewed in 159-page booklet. Detailed technical data is offered on acrylamide; 3-aminopropanol; N-tert-butylacrylamide; N,N-diallylmelamine; guanamines; 3,3'-iminobispropylamine; N,N'-methylenebisacrylamide; potassium diisopropyl dithiophosphate; surface active agents TR and BPE; and triallyl cyanurate.

"New Product Bulletin, Collective Volume III" is available on request to American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y.

### Features furfural chemical family

Furfural family of commercial and semi-commercial products is featured in 28-page bulletin. Properties, uses, and shipping information are included for furfural, furfuryl alcohol, tetrahydrofurfuryl alcohol, furoic acid, hydrofuranide, and Furalignocellulose.

Also listed are other furfural-derived chemicals available in commercial and experimental quantities. Appendix shows engineering drawings and describes bulk handling and storage layouts.

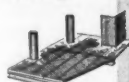
Bul 201-A is issued by The Chemicals Dept., The Quaker Oats Co., Dept. CP, Merchandise Mart, Chicago 54, Ill. When inquiring specify CP 8020 on handy form, pages 2 and 3.

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Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe.

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When inquiring check CP 8021 on handy form, pgs. 2-3

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information

Assure most accurate control of process work by using these units, which eliminate operator fatigue, can be regulated to operate at any speed and in automatic cycles, and can be remotely controlled either electrically or manually. These valves also have the straight-through flow and drop-tight seal which have made the non-wedging EVERLASTING Valves famous for almost half a century.

EVERLASTING VALVE CO., 73 Fisk Street, Jersey City 5, N. J.

**Everlasting Valves**

TRADE MARK EVERLASTING REG. U.S. PAT. OFF.

EV-208A

FOR EVERLASTING PROTECTION

When inquiring check CP 8022 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Discusses properties of glycerine

Glycerine as an ingredient in commercial formulation is subject of short bulletin. How six special properties of glycerine were put to work by manufacturers is described briefly.

Bul "Six New Products Using Glycerine" is issued by Glycerine Producers Assn., Dept. CP, 295 Madison Ave., New York 17, N. Y. When inquiring reader may simply specify CP 8023 on handy form, pages 2 and 3.

### Tabulated data covers catalyst supports

Fused alpha alumina catalyst supports are briefly discussed in four-page bulletin. Tabulated data include available shapes, sizes, chemical analyses, physical properties, and weights.

Sales Engineering Bul 7 is issued by Refractories Division, Norton Company, Dept. CP, Worcester 6, Mass. When inquiring specify CP 8024 on Reader Service slip, pages 2 & 3.

### Presents info on two complexing agents

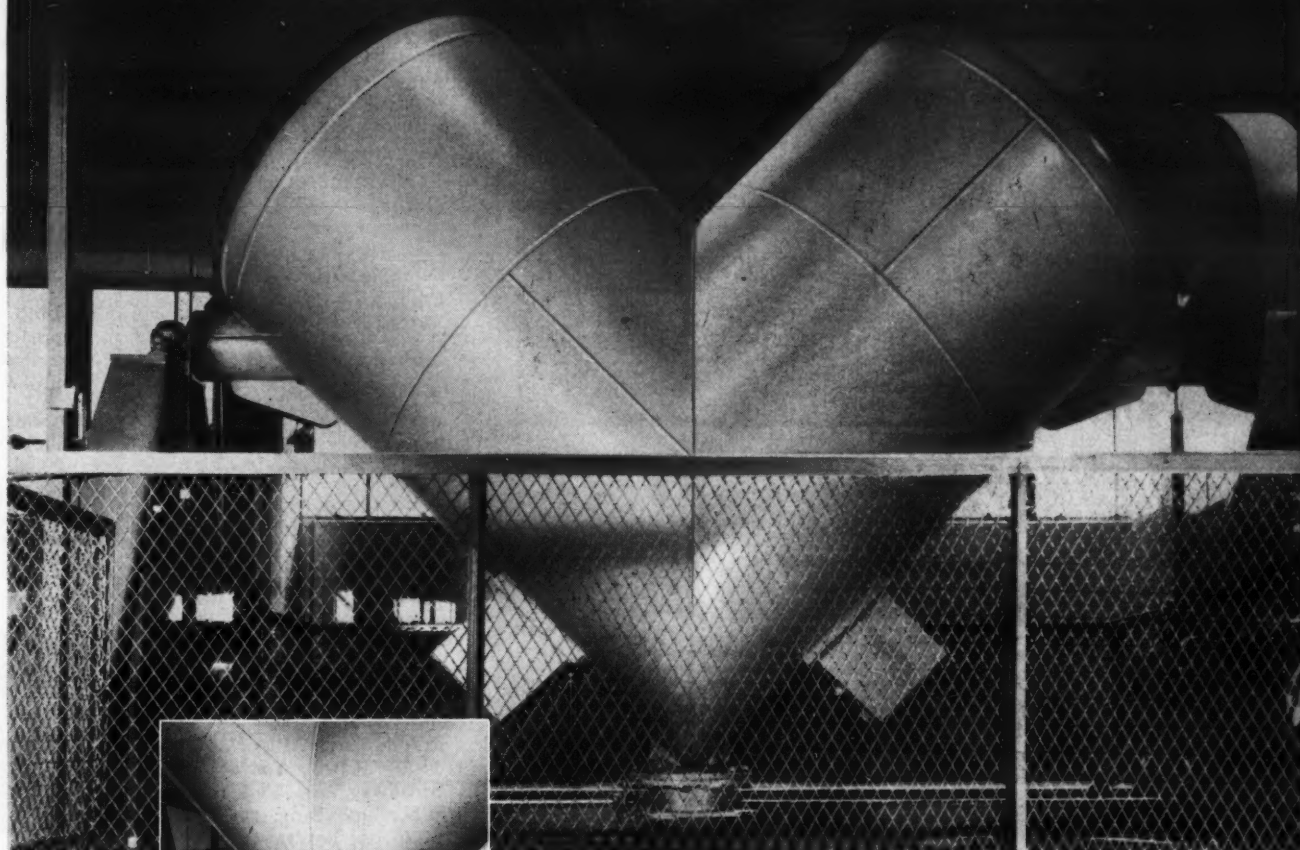
Single page bulletin gives applications and technical data on two polyamino carboxylic acid sodium salts related to ethylenediamine tetraacetic acid. The light straw colored aqueous alkaline (pH 12) solutions find use in photographic developer baths, liquid soaps, glue, and mineral separations.

Buls Chel 330 and 153A are issued by Alrose Chemical Co., Dept. CP, Box 1294, Providence 1, R. I. When inquiring specify CP 8025 on handy form, pages 2 and 3.

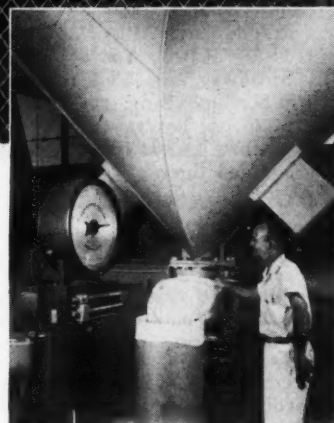
For more information on product at right, specify CP 8026  
... see information request blank between pages 2 - 3.

# HOFFMANN-LA ROCHE, INC.

## blends a 3-ton dose of vitamins



150 cubic ft. p-k blender of stainless steel-clad construction is charged through opening in floor above.



Shown is ease of discharge of p-k blender.

Hoffmann-LaRoche, Inc., Nutley, N. J., leading pharmaceutical manufacturers, find blending a three-ton dose of vitamins in one batch an easy matter with a p-k twin shell dry blender.

And, at the same time, the patented p-k blender provides perfect dispersion of the ingredients, as uniformly as a druggist compounds a single prescription.

The 150 cubic foot p-k blender shown here is at work every day in the modern Hoffmann-LaRoche plant at Nutley, N. J. Five different particle sizes are perfectly blended in 6600-lb. batches in this p-k blender. Clinical cleaning is easy, because of the wide openings of the p-k blender.

If your blending needs a shot in the arm, write today for complete information on sizes and capacities.



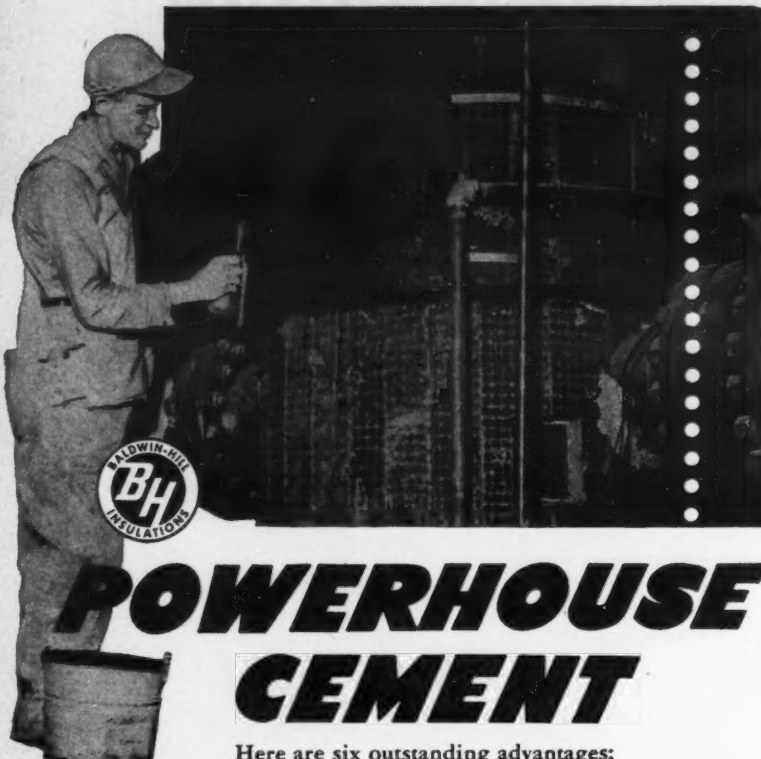
the **Patterson-Kelley Co., inc.**

740 Lackawanna Avenue, East Stroudsburg, Penna.

101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16 • and other principal cities.



## BALDWIN-HILL uses **CHEMICAL PROCESSING** to help keep heat losses down with . . .



# POWERHOUSE CEMENT

Here are six outstanding advantages:

- **ONE COAT COVERAGE** . . . It insulates as it finishes. Easy trowelling and quick hydraulic setting save time and labor in application.
- **GREATER ECONOMY** . . . 100 lb. covers 120 sq. ft.  $\frac{1}{4}$ " thick or 30 sq. ft. 1" thick. Low material cost and single coat application provide low over-all installation cost.
- **NO WIRE MESH** . . . In many instances can be trowelled directly on blocks, blankets, or other surfaces, thus saving costly application of reinforcement.
- **DRIES WITHOUT CRACKING** . . . Negligible lineal and volumetric shrinkage provides freedom from drying-shrinkage cracks.
- **NO WEATHER WORRIES** . . . Applied outside, it withstands drenching rain within two hours of application.
- **PAINTABILITY** . . . The smooth, firm, crack-free surface is perfect for finishing with oil-base or water-base paints.

For further information, get in touch with B-H Engineered Insulation Service.

## Baldwin-Hill

Clip on signed letterhead and mail

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OUT

BALDWIN-HILL COMPANY, 404 Breunig Ave., Trenton 2, N. J.

Please send complete information on

- ☐ **POWERHOUSE CEMENT** . . . High adhesion, rockwool, insulating-finishing cement
- ☐ **BLANKETS** . . . Metal-reinforced, flexible, felted, rockwool insulation
- ☐ **NO. 1 INSULATING CEMENT** . . . All-purpose, rust-inhibiting, plastic cement
- ☐ **MONO-BLOCK** . . . Rigid, felted rockwool block—for high and low temperature use

When inquiring check CP 8027 on handy form, pgs. 2-3

## NEW LITERATURE

### Shows ins and outs of temp control

Eight-page catalog covers various systems for temperature control, offers recommendations for selecting proper system.

Also outlined are suggestions for selecting the sensing element, with recommendations for proper placement, a section covering control terminology, and descriptions of manufacturer's systems.

"Temperature Control Systems" is issued by Wheelco Instruments Div., Barber-Colman Co., Dept. CP, Rockford, Ill. When inquiring specify CP 8028 on handy form located between pages 2 and 3.

### Bulletin covers properties of methylene chloride

Bulletin summarizes physical properties, solubility in various liquids, azeotrope formation, uses and reactions of methylene chloride. Vapor pressure of methylene chloride and other organic compounds is shown graphically in the 4-page bulletin.

Bul CM-1 is issued by Solvay Process Div, Allied Chemical & Dye Corp., Dept. CP, 61 Broadway, New York 6, N. Y. When inquiring specify CP 8029 on Reader Service slip which is located between pages two and three.

### Grades and types of ethanol

Technical data sheet gives grades and types of ethyl alcohol supplied by manufacturer. Detailed physical properties of the pure alcohol are given. Also included is shipping, handling, and storage information.

Technical Data Sheet No. 21 is available from Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 8030 on Reader Service slip located on pages 2 and 3.

## Pump liquids, gases, solids in solution



Just place connecting tubes in **NEW, large Sigmamotor Pump!**

• Wavelike action of steel fingers forces liquid through the

tubing. Material in tubing never touches pump. Stops contamination and corrosion.

Excellent for handling of corrosive solution. . . . **\$195.00**

Smaller unit with capacities to 30 gallons per hour. . . . **\$55.00**

## SIGMAMOTOR Inc.

18 North Main Street • Middleport, N. Y.

When inquiring check CP 8031 on handy form, pgs. 2-3

thousands of users PROVE "HI-TEMP" **C-5 THREAD COMPOUND** IS BEST FOR ALL STUD THREADS and STAINLESS STEEL APPLICATIONS

- ✓ speeds up dis-assembly time
- ✓ prevents stud breakage
- ✓ eliminates pitting of stainless steel

NO MORE FROZEN OR GALLED STUDS  
EVEN AT  
**1800° F**

Let us SEND you a **FREE SAMPLE** so you can PROVE to YOURSELF that C-5 will lick your toughest stud breakage problems!

To assure easy maintenance on products having threaded assemblies many leading product engineers have specified the use of Fel-Pro C-5 as an anti-seize coating on stud threads prior to final production line assembly.

Fel-Pro's exclusive Colloidal-Copper formula allows for easy separation and reduces stud breakage of threaded assemblies after long exposures to extreme temperatures. It eliminates pitting of stainless and alloy steel even where dissimilar metals are joined.

Conduct your own tests with C-5 "Hi-Temp" at our expense. Write on your company letterhead for Free Sample and complete data sheet TODAY!

**FELT PRODUCTS MFG. CO.** 1515 Carroll Ave., Chicago 7, Ill

When inquiring check CP 8032 on handy form, pgs. 2-3



**Tentative specs for calcium and sodium hypochlorites**

Tentative specifications for calcium and sodium hypochlorites for water treatment have been published. Seven-page booklet includes material specifications and standards for sampling, inspection, packing, marking, and testing.

AWWA B300 is available by remitting 20c direct to American Water Works Assn., Inc., Dept. CP, 521 Fifth Ave., New York 17, N. Y.

**Gives industrial applications of radiation detection cell**

Data sheet describes industrial instrumentation applications of radiation detection cell which converts nuclear radiation directly into electrical energy. When used with electrometer and null balance measuring circuit, it permits accurate determination of film thickness, density, liquid-liquid interface level, concentration of alpha, beta, gamma or neutron radiation, and the composition of binary gas systems.

Instrumentation Data Sheet 10.0-15 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Station 64, Wayne & Windrim Aves., Philadelphia 44, Penna. When inquiring specify CP 8033, pages 2 and 3.

**Effect of ZnO on rubber properties described in publication**

New issue of publication provides basic technical information on use of zinc oxide in formulation of rubber products. Summarized are chemical and physical properties of the oxide and its effect on rubber properties.

*The Activator*, Vol 11, No. 1, is issued by New Jersey Zinc Co., Dept. CP, 160 Front St., New York 38, N. Y. When inquiring specify CP 8034 on handy form, pages 2 and 3.

**Outlines operational features of speed reducers**

Complete line of speed reducers is described in 15-page booklet. Features, manufacturing techniques, and applications are discussed. Standard ratios available for all types of speed reducers are given. Special units developed for right-angle drives and in-line drives are treated along with other speed reducers developed especially for a particular industry such as steel, rubber, or mining.

Booklet B-5646 is issued by Westinghouse Electric Corp., Dept. CP, 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa. When inquiring specify CP 8035 on handy form, pages 2 and 3.

**HIGHEST QUALITY**

THROUGH 2,500,000 FILTER CHANNELS PER SQ. IN.!

A Celite Filter Cake is hundreds of times finer than the finest wire mesh!



## Celite Filtration assures perfect clarity— adds eye appeal and buy appeal to food products

TO GIVE foods and beverages that extra quality which results in more sales appeal, leading processors depend on Celite Filtration. The Celite method provides perfect clarity at high production rates.

Celite Filtration is *efficient*. It removes even the finest suspended solids. Moreover, Celite Filtration is *economical*. It may be used with any type of conventional filter, it is almost

automatic, and only unskilled labor is required for routine operation.

And Celite Filtration is *flexible*. To meet your specific requirements, Celite comes in nine standard grades of microscopically controlled particle size. The right balance between degree of clarity and rate of flow may be easily controlled. You can obtain perfect clarity in food products—highest purity in antibiotics—complete removal

of insoluble impurities from water, petroleum, chemicals, dry cleaning solvents and many other liquids.

A Johns-Manville Celite Filtration Engineer will gladly discuss the advantages and use of Celite in your product or production process. For his services, without obligation, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ontario.

\*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.



# Johns-Manville CELITE

INDUSTRY'S STANDARD  
FOR FINEST FILTRATION

When inquiring check CP 8036 on handy form, pgs. 2-3



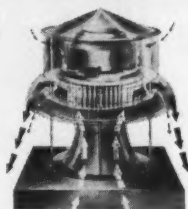
## Only AIR-VANS have the **TWO** Big Factors in Industrial Ventilation

### SAFE MOISTURE and FUME REMOVAL

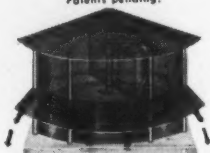
Motor out of airstream is only part of this protection. Fresh clean air is constantly drawn through the motor hood creating an air curtain around the motor shaft which absolutely prevents fumes from entering the housing while the unit is in operation.\* This eliminates most special winding motors.

### Positive Air Removal with Gallaher Scroll Effect Design\*

Where high slot speeds must be maintained Gallaher Air-Vans with patented scroll effect design are generally the answer. Design research has shown that without this feature efficiency against even 1/4" S.P. is impossible. With this feature, Gallaher units develop up to 4" static pressure and 65,000 CFM. Ratings have been certified in an independent laboratory under the direction of a nationally recognized authority.



Gallaher Air-Van Direct  
Drive 150-11,000 CFM  
S.P. to 4.2"  
Patents 2188741 2526290.  
Patents pending.



Gallaher Belt Drive 5,000-  
65,000 CFM S.P. to 4"

**The GALLAHER Company**

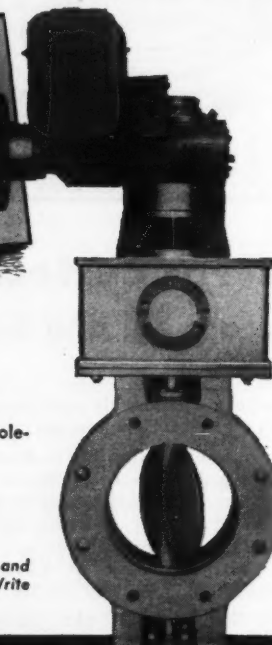
4108 DODGE STREET

OMAHA 3, NEBRASKA

\*patented exclusive feature.

When inquiring check CP 8037 on handy form, pgs. 2-3

*All* YOU COULD  
EXPECT OF  
A TRULY BETTER  
VALVE!



**Engineered for...**

**Positive, Tight Closure**—even air or bubble tight.  
**Automatic Control**—electric, air, hydraulic, float, solenoid, etc. Or manual control, if desired.  
**Pressures**—to 300 p.s.i. and higher.  
**Temperatures**—from sub-zero to 2000° F.  
**Materials**—made of any metal or rubber lined.  
**Sizes**—from 1" to 120" diameter, and larger.

We also manufacture wafer type butterfly valves; slide and gate valves; proportioning valves; swing check valves. Write for Catalog.

**w.s. ROCKWELL  
VALVES**

**W. S. ROCKWELL COMPANY**

2204 Elliot Street • Fairfield, Conn.

Butterfly valve with outboard roller bearings, electric motor operator and auxiliary hand-wheel control, for high velocity air at 125 p.s.i. and temperatures from minus 20° to plus 200° F.

When inquiring check CP 8038 on handy form, pgs. 2-3

## NEW LITERATURE

### Chemical Index available

Comprehensive alphabetical listing of chemicals, solutions, and preparations comprises 304-page bound catalog. Included are sections on bacteriological culture media, fluid extract spirits, and tinctures. Company's certified reagents are indicated.

Cat 115-C is available from the Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 8039 on handy form, pages two and three.

### Shows handling, uses of germicide

Guide to formulators in handling and use of sodium p-toluene chlorosulfonamide germicide and mild bleaching agent, shows proper handling procedures. Also included are lists of compatible and incompatible substances, chemical and physical properties, and mechanism of action.

Bul O-101 on Chloramine-T, N.F. is issued by Organic Chemicals Division, Monsanto Chemical Co., Dept CP, 1700 S. 2nd St., St. Louis 4, Missouri. When inquiring, specify CP 8040 on convenient Reader Service slip, pages 2 and 3.

### Developments in heating plastics machinery

Reprint of recent speech discusses principles for successful application of liquid heat transfer media to heating and cooling of plastics calendars, extruders, injection molders, and presses. Advantages of liquid heating over other methods are discussed. Photographs, charts, and drawings are included in the eight pages.

"New Developments in Liquid Heating of Plastics-Processing Machinery" is issued by American Hydrotherm Corporation, Dept. CP, 33-70 12th Street, Long Island City 6, N. Y. When inquiring specify CP 8041 on handy form, pages 2 and 3.

## FREE TRIAL OFFER NO STRINGS ATTACHED



**A VALUABLE KIT**  
Carton contains 6 grades of ultra-fine quality, assorted fine grit abrasive compounds suitable for a variety of work. Coarser grit compounds can also be supplied.

**6  
LIBERAL JARS  
DIFFERENT  
GRADES**

### FOR MAINTENANCE LAPING

Here's a get-acquainted offer you can't afford to miss. Hard and soft abrasives that can be used in the maintenance of all types of processing equipment. Sent postpaid anywhere in the U.S. and Canada.

No obligation—write today on your company letterhead.

**PROVE THEM AT OUR EXPENSE!**

**UNITED STATES PRODUCTS CO.**

515 MELWOOD ST.



PITTSBURGH, PA.

When inquiring check CP 8042 on handy form, pgs. 2-3

## Protect Product Purity

with fully  
corrosion-resistant

**"Metalsmiths"  
Stainless Steel  
and Monel  
Utensils**

Designed and constructed to meet the strictest requirements of Chemical lab and plant. Many sizes in items shown, plus stock pots, batch cans, beakers, shovels. Try "Metalsmiths" utensils and compare the value. We ship promptly—anywhere.



**WRITE FOR LATEST CATALOG — PRICE LIST**

**METALSMITHS**  
Division of Orange Roller Bearing Co., Inc.  
556 White Street Orange, N. J.

When inquiring check CP 8043 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Complete line of fluid gages, valves, controls described**

Manufacturer's complete line of small valves, pressure regulators, stainless steel cylinders, flow gages, and oxy-gas torches is described and illustrated in 66-page catalog. Information and specification data are given on several kinds of fluid controls and accessories. Several pages are devoted to engineering data sheets which include schematic drawings of various units and flow sheets on their applications.

Cat No. 2 is issued on request to Hoke, Inc., Dept. CP, 145 South Dean Street, Englewood, New Jersey.

**Application methods, concentrations for eight silicone release agents**

Seven-page data sheet is a summary of experience regarding application methods and optimum concentrations of eight different silicone release agents: a fluid, four emulsions, a solvent solution, and two coating resins. Plastics discussed include, among others, the acrylics, epoxies, phenolics, polyesters, vinyls, and the silicones themselves.

Data sheet 5-104 is issued by Dow Corning Corp., Dept. CP, Midland, Mich. When inquiring specify CP 8044 on handy form, pages 2 and 3.

**Manufacturer's line of hoists in illustrated catalog**

Condensed, full-line catalog contains illustrations, descriptions, and specifications for over 100 types and sizes of portable hoists.

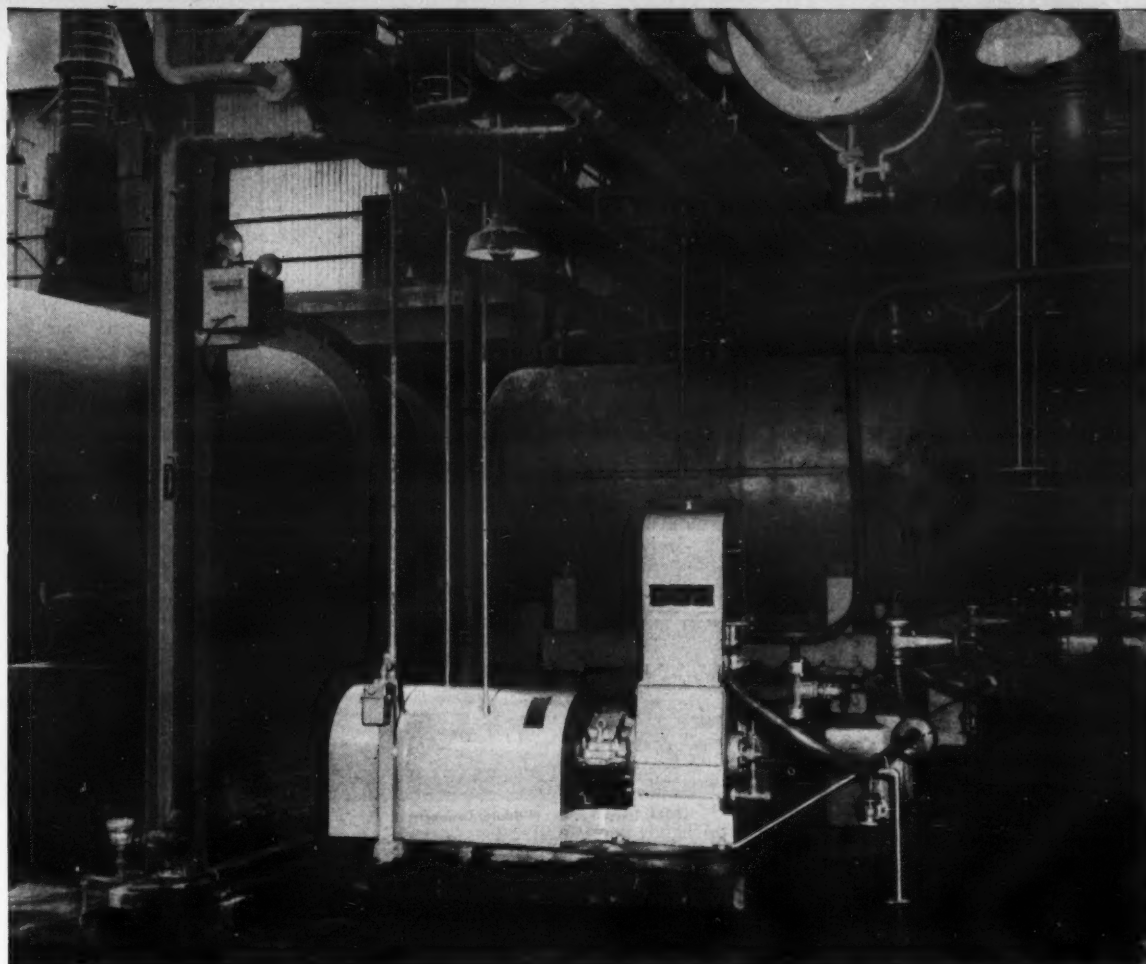
Among units described in the 8-page, 8½ x 11" catalog are manufacturer's Ratchet lever hoists (both roller- and coil-chain models) with capacities from ¾ to 15 tons, a complete line of standard and specialized spur gear hoists, electric hoists, all-purpose hoists, "Mighty Midget" pullers designed to hang on a tool belt, and a wide variety of utility maintenance tools.

Bul CL is issued by Coffing Hoist Co., Dept. CP, 800 Walter St., Danville, Ill. When inquiring specify CP 8045 on handy form, pages 2 and 3.

**Presents instrument specs**

Process control instruments are described in two-color, 20-page catalog. Lists flow meters, recorders, controllers, pressure regulators, sight flow indicators, and chemical feeders.

Cat 2 is issued by Fischer & Porter Company, Dept. CP, 924 Jacksonville Road, Hatboro, Pa. When inquiring specify CP 8046 on handy form, pages 2 and 3.



**Another Chemical Pumping Job — handled by ALDRICH**

This scene is the plant of a leading manufacturer of explosives, where the Aldrich Triplex Pump pictured in the foreground pumps nitric acid at the rate of 185 lbs. per minute against 400 psi maximum pressure.

It's one of many jobs Aldrich Pumps are called upon to do in the chemical industries. These versatile pumps are ideal wherever applications involve corrosion, abrasive materials, high viscosity or high pressure. In addition to nitric acid, among the many

liquids handled by Aldrich Pumps are caustic solutions, fatty acids, acetic acid, aqua ammonia, anhydrous ammonia, as well as liquids encountered in the petroleum refining, petroleum chemical and other industries.

Several types of Aldrich Pumps are available to meet your specific needs. For automatically controlled delivery Aldrich-Groff "POWR-SAVR" Pumps can handle any free-flowing liquid at discharge pressures from 300 to 15,000 psi and are available in six sizes—from 2" to 6" stroke and

from 5 to 125 bhp. (For information, write for Data Sheet 65.) For medium to high pressure service you may need one of the many Aldrich Constant Stroke Pumps—the Direct Flow Triplex or Multiplex Pump (Data Sheets 64, 64A, 64B).

Take advantage of our broad experience in building pumps for the chemical industry and let us make specific recommendations to meet your chemical needs. No matter what your problem, we welcome your inquiries or requests for literature.

**The Aldrich Pump Company**

23 GORDON STREET • ALLENTOWN, PENNSYLVANIA

Representatives in Principal Cities



When inquiring check CP 8047 on handy form, pgs. 2-3



## When Your Process Demands **FILTERING** **MIXING** **STORING**



### LOOK FOR THESE FEATURES

PROVED, LOW-COST OPERATION  
EASY TO CLEAN  
DEPENDABLE, TROUBLE-FREE  
PERFORMANCE  
ALL SIZES AND CAPACITIES  
LOW UPKEEP

Regardless of the size or type of your installation, whatever your process may be, there's an Alsop Filter, Mixer and Storage and Mixing Tank to "fit your job", you can be sure of getting from Alsop the right unit properly applied — you can depend on Alsop proved performance features. Alsop Filters, Mixers and Tanks are available in a complete range of sizes and capacities and Alsop Equipment is custom fitted to your application by engineers who have thorough experience in Filtration and Agitation. Look for the proved features and the benefits that Alsop Filters, Mixers and Tanks can bring to your processing operations. Write for full information, recommendations and quotations.

When inquiring check CP 8048 on handy form, pgs. 2-3

**ALSOP**  
ENGINEERING CORPORATION

9041 Alsop Square, Milford, Connecticut

## 3 seals answer a thousand problems

**SEALOL-FLEXIBOX** — the high-efficiency mechanical seal with the unique spring drive — answers all types of shaft sealing problems.

**FOR STUFFING BOX INSTALLATION**  
Replaces conventional packing . . . positive sealing . . . long service life.

**FOR DESIGNED-IN-PUMP INSTALLATION**  
Completely eliminates stuffing boxes — decreases shaft overhang.

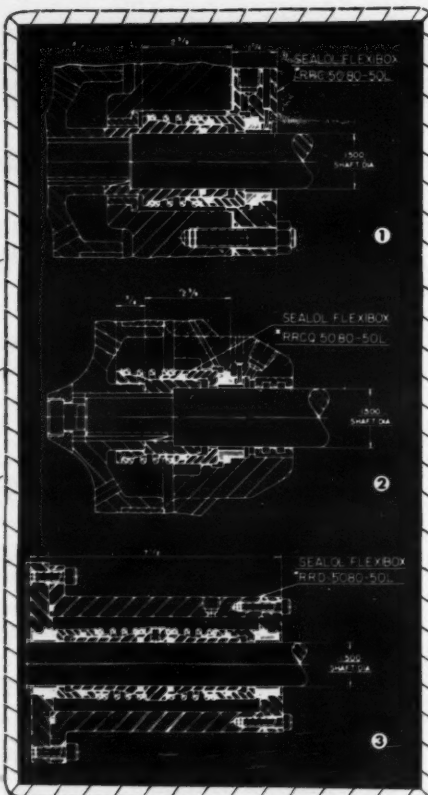
**FOR SPECIAL APPLICATIONS**  
Double seals; lubricated seals; special materials; designs for agitators, mixers, and special services.

Send for Bulletin 9, full details on Sealol-Flexibox Seals. Also tell us about your shaft sealing problems . . . for engineering data and recommendations. Sealol Corporation, 21 Willard Avenue, Providence 5, Rhode Island

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CLEVELAND • HOUSTON • SAN FRANCISCO  
LOS ANGELES • KANSAS CITY (MO.)  
CHARLESTON (W. VA.)

**SEALOL**

THE BALANCED PRESSURE SEAL



When inquiring check CP 8049 on handy form, pgs. 2-3

## NEW LITERATURE

### **Calls attention to plant effluent neutralization**

Third in a series of water pollution abatement manuals reports a healthy trend in laws covering the subject. Purpose of the manual, entitled "Neutralization of Acidic and Alkaline Plant Effluents," is to set forth a program for neutralizing industrial wastes to further the purification of streams.

Laboratory and engineering studies to be undertaken prior to treating polluted water are described. General methods of treatment for acidic effluents and equipment required are indicated. Included is a table listing various alkalis to be used in neutralizing acidic effluents.

Two sections of the manual are concerned with the processes for neutralizing alkaline effluents and include a description of insoluble sludges resulting from neutralization. Safe practices to be followed in carrying out processes are indicated.

Manual W-3 is available by remitting 25 cents direct to Manufacturing Chemists' Association, Dept. CP, 1625 Eye St., N. W., Washington 6, D.C.

### **Electrical meters pictured**

Maker's Type DP-11 and DP-12 portable DC indicating instruments are described and pictured in eight-page, two-color bulletin. Applications, features, performance and price of instruments are given.

Bul GEC-979A is issued by General Electric Co., Dept. CP, One River Road, Schenectady 5, N.Y. When inquiring check CP 8050 on handy form, pages two and three.

### **Manufacturing details of centrifugal pumps**

Manufacture of stainless steel centrifugal pumps is covered in some detail in 4-section catalog. Complete engineering data, performance curves, capacity charts, and seal application are included.

## 9 Good Reasons why corrosion-resisting Inco-Cast Fittings can solve your problem

**Monel® Nickel - Inconel®**



- 1 Resist most corrosives
- 2 Strong . . . tough . . . sound
- 3 Withstand high and sub-zero temperatures
- 4 Protect product purity
- 5 Pressure-tested
- 6 Economical in cost
- 7 All standard types and sizes in threaded and welding fittings
- 8 Fast service on rated orders to all points from conveniently located distributors' stocks
- 9 Special shapes and sizes made to order

WRITE—  
for price list catalog. Contains full information. Sent you promptly, and without obligation.

The International Nickel Company, Inc.  
67 Wall Street New York 5, N.Y.



When inquiring check CP 8051 on handy form, pgs. 2-3



**FREE BOOK  
SHOWS HOW  
90% of Leaky Roofs  
Can be Saved**

**Cut Costs in HALF with Unskilled Labor**

There are no secrets or special skills to good roof repair! Free step-by-step book shows exactly how to recondition roofs . . . to give 90% of leaky roofs extra years of weather-tight life . . . to do the job right with unskilled labor at HALF the cost. Your business letterhead request brings "Saving Old Roofs" free. Write today!

**THE TROPICAL PAINT & OIL COMPANY**

1128-1280 W. 70th • Cleveland 2, Ohio  
HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883

When inquiring check CP 8052 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

The four sections, designated 253-I, 253-N, 253-S, and 253-D, discuss centrifugal pumps for industrial corrosion-resistant service, nonfoaming service, sanitary service, and selection and application data for each, respectively.

Cat 253 is issued by Tri-Clover Machine Co., Dept. CP, 2500 60th St., Kenosha, Wis. When inquiring specify CP 8053 on handy form, pages 2 and 3.

### Durable floors shown in four pages

Long-lasting floor surface for areas subjected to extreme production or traffic abuses is described in four-page, illustrated folder. Advantages are fully explained in terms of materials used and methods of application. Anchorage feature of steel flooring is detailed.

Floor protection folder is issued by Flash-Stone Co., Dept. CP, 3723 Pulaski Ave., Philadelphia 40, Pa. When inquiring specify CP 8054 on handy form, pages 2 and 3.

### Transmission products tabulated in brochure

Manufacturer's flexible couplings, variable speed pulleys and transmissions, and universal joints are presented in 8-page brochure. Typical equipment is pictured; specifications and advantages are given over a wide range of applications.

"Power Transmission Products" is available from Lovejoy Flexible Coupling Co., Dept. CP, 4965 W. Lake St., Chicago 44, Ill. When inquiring reader may simply specify CP 8055 on convenient Reader Service slip located between pages 2 and 3.

For more information on product at right, specify CP 8056 . . . see information request blank between pages 2 - 3.

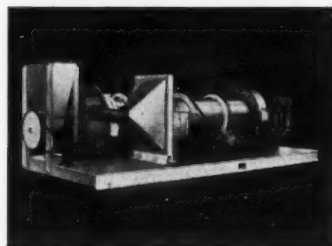


direct fired

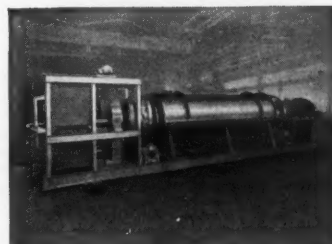
# Rotary Kilns

Oil fired units can be rotated at speeds ranging from 2 Rev./Hr. to 5 Rev./Min. to control the length of time the material is under treatment.

Temperatures range from 1000° F. to 2200° F. depending upon the material being handled. Burners are controlled automatically with radiation pyrometers. Heated material is passed through a Bartlett-Snow externally water cooled cooler—and cooled slowly, at gradually declining temperatures. Use Bartlett-Snow's complete facilities—including materials handling—on your next job. It fixes unit responsibility—assures the smooth synchronized operation of the entire project—and utmost economy and satisfaction.



Special Stainless Steel Dryer for Processing a Costly Anti-Biotic without Contamination.



Calciner and Cooler for Continuous Processing at Temperatures from 900° F. to 2100° F.

DESIGNERS  
ENGINEERS

**BARTLETT  
-SNOW**  
CLEVELAND 5, OHIO

FABRICATORS  
ERECTORS

Dryers • Coolers • Calciners • Kilns  
"Builders of Equipment for People You Know"



# IN A FILTER OR STRAINER IT'S

design  
accuracy  
craftsmanship

FOR BETTER SERVICE

## "CLEVELAND" FILTERS AND STRAINERS

No task too big — no problem too small for CLEVELAND strainers and filters. We design, build and produce strainers and filters for every purpose in any size or dimension or metal.

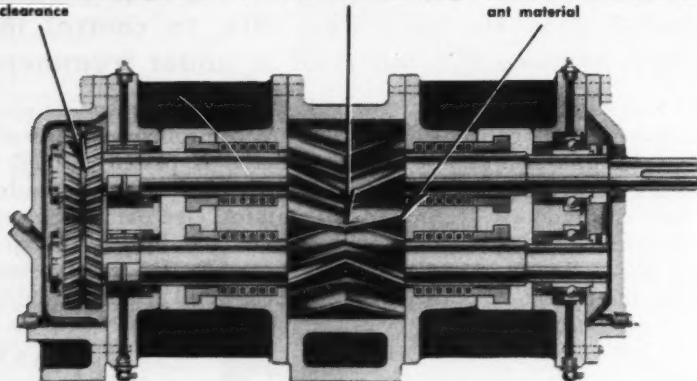
Easy to order — our engineers will help you to analyze your problem. Send us your requirements!

WRITE FOR BULLETIN NO. 7  
THE CLEVELAND WIRE CLOTH & MFG. CO.  
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When inquiring check CP 8057, on handy form, pgs. 2-3

## GEAR PUMP MAINTAINS EFFICIENCY HANDLING CORROSIVE LIQUIDS

Precision-cut external timing gears maintain proper rotor clearance  
No metallic contact between rotors or rotors and casing  
Wetted parts made of any machineable corrosion-resistant material



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External Gear and Bearing

**"GEAREX" PUMPS**

32 SSU to 1,000,000 SSU; 1-550 GPM; 250 PSI for viscous liquids, 50 PSI for water. Direct-connected up to 1800 RPM. Horizontal or vertical construction. Jacketed bodies available. Sier-Bath Gear & Pump Co., Inc., 9260 Hudson Blvd., North Bergen, N. J.



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... Send for Bulletin G-2.  
Founded 1905 Member A.G.M.A.

Sier-Bath Screw, "Gearex" and "Hydrex" Pumps... also manufacturers of Precision Gears and Flexible Gear Couplings  
When inquiring check CP 8058 on handy form, pgs. 2-3

## NEW LITERATURE

### Reports on tanks of redwood

Characteristics and mechanical properties of redwood for industrial tanks are discussed in 4-page folder. Various applications for redwood tanks are described and illustrated.

Folder S-3 on redwood tanks is issued by George Windeler Co., Ltd., Dept. CP, 2201 Jerrold Ave., San Francisco 24, Calif. When inquiring specify CP 8059 on handy form, pages 2 and 3.

### Tips on underground insulation

Information on installation of triple-zone insulation for hot underground pipes is given in 4-page bulletin. Application of material, which is said to protect pipes against corrosion caused by acid and alkaline ground waters, bacterial action, roots, and electrolysis, is pictured and brief technical data are given.

Bul on Gilsulate is issued by American Gilsonite Co., Dept. CP, 134 West Broadway, Salt Lake City 1, Utah. When inquiring reader may simply specify CP 8060 on handy form, pages 2 and 3.

### Dispersion problems discussed in book

Dispersion problems in industry and chemical processes are discussed in 40-page book. Practical and theoretical aspects are presented on behavior of materials in solid, liquid, and dispersional phases. Charts compare results of various dispersion methods and include other technical data.

Manufacturer's dispersion mills, including installations, are described. Book contains many photographs and illustrations.

"The Kady Mill" is issued by Kinetic Dispersion Corporation, Dept. CP, 185 Botsford Place, Buffalo 16, N. Y. When inquiring specify CP 8061 on handy form, pages 2 and 3.

## new SPRAY NOZZLE

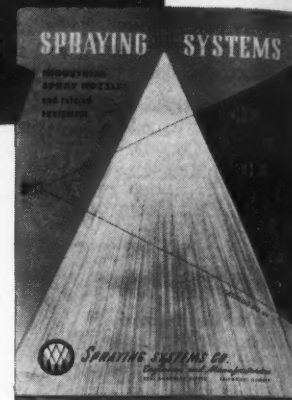
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to help you improve a spraying operation

to help you lower a spraying cost



The most complete industrial spray nozzle catalog ever produced. Gives you reference data on thousands of standard and special spray nozzles for every type of spraying.

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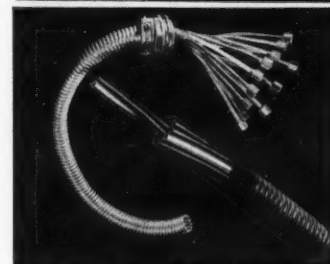
SPRAYING SYSTEMS CO.  
3216 Randolph St. Bellwood, Illinois

When inquiring check CP 8062 on handy form, pgs. 2-3

## MAXIMUM PROTECTION FOR YOUR TUBES

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ARMORED MULTITUBE



— carries air, gas or fluid on moderate to long runs

1/4", 5/16", 3/8" & 1/2" O.D. TUBES

From 2 to 19 Tubes twisted together, protected by flexible, interlocked, galvanized steel armor. One colored tube in each layer permits ready identification at each end. Bends without any distortion of tubing. Tubes available in copper, aluminum, polyethylene and other plastics. CRESCENT ARMORED MULTITUBE gives a better protected installation with substantial savings. Licensed under U. S. Patent 2,578,280

SEND FOR BULLETIN

**C R E S C E N T**  
INSULATED WIRE & CABLE CO.  
TRENTON 5, N. J.

When inquiring check CP 8063 on handy form, pgs. 2-3

**Lists advantages of high lift truck having platform height of 123"**

Four-page folder describes with illustrations manufacturer's worksaver telescopic high-lift truck in 3000 and 4000 lb capacities.

Features of truck as described in bulletin include elevated platform heights up to 123", roller-mounted channels and platform for reducing friction, a 16" diam turntable with 105 ball bearing and tapered roller support bearing for easy steering in tight quarters and narrow aisles.

Included in bulletin are drawings giving specifications as well as dimension tables.

Bul P1512B is issued by Materials Handling Div., Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia, Pa. When inquiring specify CP 8064 on handy form, pages 2 and 3.

**Offer zein bibliography**

Annotated bibliography of 118 pages is offered as a comprehensive guide to literature on zein (alcohol-soluble protein from corn) for the period 1891 to 1953, inclusive. Large portion of reference is devoted to uses and applications. A patent index is included.

Bul 7, "Zein", is issued on direct request to Mellon Institute, Dept. CP, 4400 Fifth Ave., Pittsburgh 13, Pa.

**Improvements of excavator outlined in catalog**

Eight-page, two-color catalog describes manufacturer's 15 ton lift,  $\frac{1}{2}$  cu yd capacity excavator.

Illustrated with 25 photos and diagrams and featuring a brief, concise text, catalog describes heavy-duty operating features of the 205 when equipped as a shovel, hoe, crane, or dragline. Unit is available with either crawler-mounted or on a truck body.

Catalog describing the 205 Excavator is issued by Koehring Co., Dept. CP, Milwaukee, Wis. When inquiring specify CP 8065 on handy form, pages 2 and 3.

**Presents pertinent information on float and lever valves**

Float and lever valves are described in 15-page catalog. Included are descriptive index, capacity tables, dimensions and weights, and schematic drawings.

Cat 107 is issued by the Schade Valve Mfg. Co., Dept. CP, 2527-2537 N. Bodine St., Philadelphia 33, Pa. When inquiring specify CP 8066 on handy form, pages 2 and 3.

THESE 240 STANDARD GAS CYLINDERS EQUAL

ONE  
TAYLOR-WHARTON  
38 TUBE GAS  
TRANSPORT



TAYLOR-WHARTON GAS TRANSPORTS mean safety, economy and convenience. Available in 30 and 38 tube, single or double axle construction, these units are now successfully carrying: Oxygen, Nitrogen, Helium, Boron Trifluoride, and Hydrogen. Your solution to problems of high pressure gas storage or bulk transportation.

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Also Manufacturers of: Manganese Steel Castings, Alloy and Carbon Steel Castings, Special Truckwork, Gas Cylinders

When inquiring check CP 8067 on handy form, pgs. 2-3





## RICHMOND super-sifter

**"... doing a better job ..."  
in a Wood Flour Mill**

Mr. James B. Stamps, Vice-President, Allen-Rogers Corporation (turned wood products) recently wrote:

"Our new flour mill has been in operation for something over a year now, and we have had an opportunity to observe closely the results which we are obtaining from the sifter, magnets, and stream splitter which we purchased from your company.

"We are very happy to tell you that in all cases these are performing satisfactorily and are indeed doing a better job than any other similar devices which we have used in the past."

Perhaps your plant can profit from the use of RICHMOND SIFTERS, too.

**RICHMOND MANUFACTURING COMPANY**  
AFFILIATED WITH NOVADOL-AGENE CORP.  
**LOCKPORT, NEW YORK**

When inquiring check CP 8068 on handy form, pgs. 2-3

**where others fail....**

## SHRIVER DIAPHRAGM PUMPS

**Pay Off!**

- in
- better efficiency
  - less supervision
  - less maintenance
  - lower costs

for CORROSIVE • ABRASIVE  
VISCIOUS • THICK • VALUABLE  
DELICATE OR  
HAZARDOUS MATERIALS

It pays to use this positive action, large volume, efficient pump on materials that clog and destroy conventional pumps. No packings, no leakage; easy to clean and maintain; low operating cost. Built of any material; pressures to 100 p.s.i. Rated capacity—1 to 90 g.p.m.

**T. SHRIVER & CO., Inc.** 846 Hamilton St. • Harrison, N. J.  
Filter Presses • Filter Media • Diaphragm Pumps

When inquiring check CP 8069 on handy form, pgs. 2-3

### NEW LITERATURE

#### Pipeline repair products listed

Features and specifications of several products used for pipeline repair are described in 12-page catalog. Clamps, plugs, and gaskets are covered in text. Applications are illustrated.

Cat 11 is issued by Adams Pipe Repair Products, Dept. CP, 2453 Merced Ave., P. O. Box 21, El Monte, Calif. When inquiring specify CP 8070 on handy form, pages 2 and 3.

#### Describes ultrasonic industrial cleaning

How the ultrasonic generator works, principles of high-frequency sound cleaning, and examples of present applications are explained in four-page bulletin. Photographs and drawings show components of equipment and generator in use.

GEA-6056 is issued by General Electric Co., Dept. CP, One River Road, Schenectady 5, N. Y. When inquiring specify CP 8071 on handy form, pages 2 and 3.

#### Explains applications of plastic pipe

Description of two principal kinds of plastic pipe made by company is included in 12-page, two-color catalog. Joining of pipe is discussed and engineering and corrosion data are listed.

Adv. 603 is issued by Republic Steel Corp., Dept. CP, 3100 E. 45th St., Cleveland 27, Ohio. When inquiring specify CP 8072 on handy form, pages 2 and 3.

#### Dowtherm equipment, systems reviewed

Dowtherm vaporizers and heaters for high temperature, low pressure vapor and liquid phase process heating are discussed in 28-page catalog. Fully illustrated, including photographs, charts, and colorful cut-away

## CAMBRIDGE pH INDICATORS and RECORDERS

**Labor saving — profit producing!**

In addition to portable pH Meters, Cambridge makes line-operated Direct Reading pH Indicators and Recorders for permanent installation. They are accurate, stable and assure continuous and trouble-free performance. Either the Recorder, Indicator or both, may be located at any reasonable distance from one or several sampling points. The Glass Electrodes are placed in vapor-tight housings of clog-free sampling chambers.

Send for Bulletin No. 910 T

## CAMBRIDGE pH EQUIPMENT

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**PIONEER MANUFACTURERS  
OF PRECISION INSTRUMENTS**

When inquiring check CP 8073 on handy form, pgs. 2-3

• FOR GAUGING LIQUIDS  
OF ALL KINDS  
• 100% AUTOMATIC  
• APPROVED BY  
UNDERWRITERS'  
LABORATORIES

**"LIQUIDS WORTH STORING  
ARE WORTH MEASURING"  
WITH A  
LIQUIDOMETER  
Tank Gauge**

WRITE FOR COMPLETE DETAILS

**THE LIQUIDOMETER CORP.**  
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 8074 on handy form, pgs. 2-3

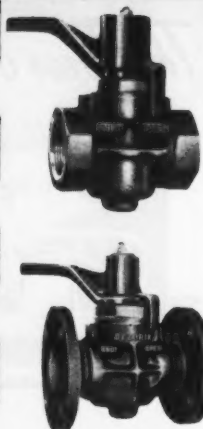
CHEMICAL PROCESSING

**NO STICKING**

**NO GUMMING**

**NO FRICTION**

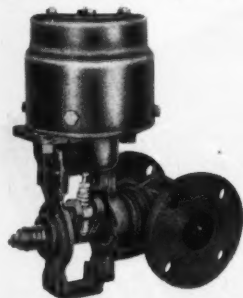
**NO LEAKAGE**



**AND NO CORROSION!**

**WHEN CORROSIVE CHEMICALS RUN THRU  
DeZURIK VALVES  
WITH TEFLON-FACED\* PLUGS**

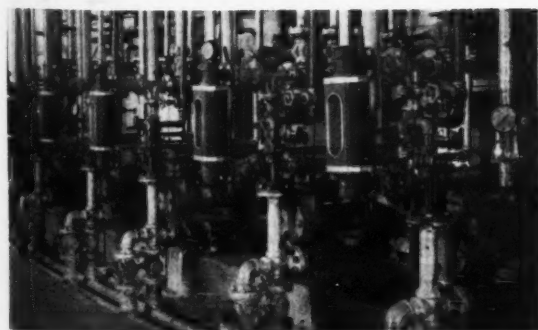
DeZURIK EASY-OPERATING PLUG VALVES have many proved advantages: They're friction-free, require no lubrication, open and close e-a-s-i-l-y every time. Now there's the extra advantage of TEFLON-Faced plugs, providing a valve for corrosive services that resists deterioration, can't distort and won't gum-up. There's a DeZurik Valve for every chemical situation — just ask for details.



DeZurik Valves with TEFLON-Faced Plugs are made in sizes from 1/2" thru 2", for manual operation, or for use with Air Operators (illustrated). Valves with rubber-faced plugs up to 20" in size.

**DeZURIK SHOWER COMPANY  
SARTELL, MINNESOTA**

\*Reg. TM - E.I. Du Pont de Nemours & Co.



When inquiring check CP 8075 on handy form, pgs. 2-3

**NEW LITERATURE**

drawings, catalog shows various systems, basic design considerations, application examples, and specifications.

Heat transfer data and properties of saturated Dowtherm vapors are listed.

Cat A-100 is issued by Eclipse Fuel Engineering Co., Dept. CP, 1001 Buchanan Street, Rockford, Illinois. When inquiring specify CP 8076 on handy form, pages 2 and 3.

**Describes sturdy, light  
flexible couplings**

Line of geared flexible couplings for high speed, high torque applications is described in four-page folder. Uses and features of these light, sturdy units are pictured. Specifications are tabulated.

Folder 2375 is issued by Link-Belt Co., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring specify CP 8077 on handy form, pages 2 and 3.

**Precision balances  
outlined**

Two-color, four-page bulletin describes manufacturer's line of English-made precision balances now available. Illustrations accompany data on capacities and sensitivities.

Bul 329 is issued by the Burrell Corp., Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. When inquiring specify CP 8078 on handy form, pages 2 and 3.

**Describes laboratory  
apparatus**

Laboratory glassware, ovens, furniture, and accessories are described in 24-page, two-color booklet.

"What's New for the Laboratory" is issued by Scientific Glass Apparatus Co., Inc., Dept. CP, 100 Lakewood Terrace, Bloomfield, N.J. When inquiring specify CP 8079 on handy form, pages 2 and 3.

**Complete**

Plant Facilities For Custom or Production Runs in Fabrication of Carbon Steel, Stainless Steel, Clad Steel, Alloy or Aluminum

**Experience**

That Keeps Pace with the Most Exacting Design Specifications for new Chemical Processing Equipment

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That is a Habit Proven in Service of Leading Chemical Manufacturers on the Atlantic Seaboard

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QUALITY FABRICATORS SINCE 1922  
NORRISTOWN, PENNSYLVANIA

When inquiring check CP 8080 on handy form, pgs. 2-3



## a *New* filter plate for plate and frame presses

- strong yet light...
- easy to handle...
- easy to clean and maintain...
- easily adaptable to all filter presses

### "MULTI-PLATE"

A new, unique, thoroughly proven filter plate with worthwhile advantages. Strong — yet much lighter, hence, easier to handle; from 40 to 80% lighter than cast plates of same size. Because it is made of sheet metal and bar stock of any desired alloy, it has a smooth surface; resists corrosion better; is easier to clean, wash, steam and sterilize.

Multi-Plates are especially suitable for delicate or sensitive chemicals, dyes, pharmaceuticals and kindred materials.

Multi-Plates are available in flush plate, washing or non-washing type, open or closed discharge; also in recessed type; may be used with any textile or metallic filter cloth.

Write for Bulletin 541.

**MULTI-METAL WIRE CLOTH CO., INC.**  
1356 GARRISON AVENUE NEW YORK 59, N. Y.

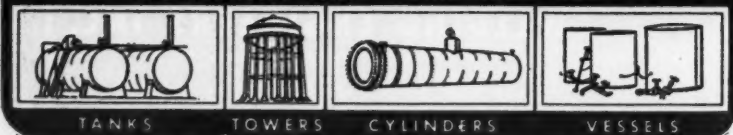
When inquiring check CP 8081 on handy form, pgs. 2-3

## COLE ALUMINUM TANKS

We have available stock sizes from 9,500 to 22,800 gallons for pressure storage, and tanks of 99.6% pure aluminum for hydrogen peroxide from 5,000 to 11,150 gallons. "Cole" can furnish tanks made of steel, aluminum and stainless steel — built in accordance with ASME Code — to meet all insurance requirements. We invite your inquiries for high pressure storage tanks, elevated tanks, acid or oil storage tanks, bins, boilers, stacks, etc.



**R. D. COLE MFG. CO.**  
NEWNAN, GA. Established 1854



TANKS TOWERS CYLINDERS VESSELS

When inquiring check CP 8082 on handy form, pgs. 2-3

## NEW LITERATURE

### Gives technical info on lacquer solvent

Bulletin gives physical, chemical, and physiological properties of ethylene glycol monoethyl ether acetate. Specification and shipping information; resin solubilities; and data on its performance in nitrocellulose lacquers are covered.

Bul F-8296 is issued by Carbide and Carbon Chemicals Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 8083 on handy form, pages 2 and 3.

### Reports progress in rare earths use

Progress report contains latest technical data on use of rare earths in the ferrous field. Description of in-progress experiments, present successful applications, and potential applications is included along with tables and graphs.

Bul "Progress Report #1" is issued by Molybdenum Corp. of America, Dept. CP, Grant Bldg., Pittsburgh 19, Pa. When inquiring specify CP 8084 on handy form, pages 2 and 3.

### Infrared spectrometer described

Three versions of single beam infrared spectrometer are featured in six-page, two-color brochure. Units — non-recording, recording, mobile recording — are illustrated; complete specifications are given.

"Model 12-C Infrared Spectrometer" is issued by the Perkin-Elmer Corp., Dept. CP, Norwalk, Conn. When inquiring specify CP 8085 on handy form, pages 2 and 3.

### Selection of purifiers aided by graphs

Four-page bulletin aids in selection of purifiers and separators by plotting specifications

## The Tires on Your Trucks

probably had their treads *pre-stressed* to insure extra mileage, in equipment containing TRENT

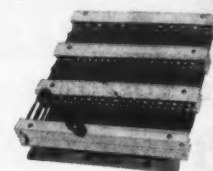


### "FOLDED-and-FORMED"

#### HEATING ELEMENTS

This is another example of the hundreds of different applications for these efficient, long-life heating elements... unequalled for easy installation and trouble-free operation.

"Folded - and - Formed" Heating Elements in Standard 12" x 12" Racks — arranged vertically or horizontally, singly or in multiples, to provide any required K. W. at temperatures up to 1350°F. Also available in Custombuilt Racks in wide variety of sizes. *What is YOUR heating problem?*



**TRENT INC.**  
Electrically Heated Industrial Equipment  
235 LEVERINGTON AVE. PHILA 27 PA.

When inquiring check CP 8086 on handy form, pgs. 2-3

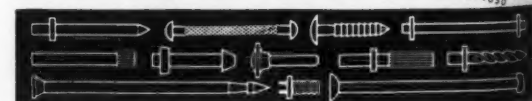
## WRITE FOR FREE fastener catalog



A complete, comprehensive handbook on cold-headed nails, rivets, screws and other special fasteners. Check on ways to improve your assembly cost-wise, appearance-wise and from a standpoint of maximum effectiveness at minimum cost. One hundred years of experience are at your service. Write for price quotations or for suggestions on the redesigning of your present assembly.

**JOHN HASSALL, INC.**

P.O. Box 2196 Westbury, L.I., N.Y.



When inquiring check CP 8087 on handy form, pgs. 2-3

CHEMICAL PROCESSING

in graph form. Text discusses uses, advantages and operation. Supplementary line drawings and tables are included.

Bul 201 is issued by Purifier Div., The V. D. Anderson Co., Dept. CP, 1935 W. 96th St., Cleveland 2, Ohio. When inquiring specify CP 8088 on handy Reader Service slip which is located between pages two and three.

#### Features facts about silicon carbide

Pertinent facts on silicon carbide are presented in 52-page brochure. Properties of material as related to various abrasives, refractories, resistors, metallurgical uses, and miscellaneous products are discussed. Manufacturing techniques are outlined and an extensive bibliography is given.

Brochure on silicon carbide is issued on request to The Carborundum Company, Dept. CP, Niagara Falls, N. Y.

#### Gives data, specs on gas, liquid petrol lift trucks

Comparative data and specifications on manufacturer's gasoline, diesel and liquid petroleum gas-powered fork lift trucks with capacities from 1000 to 10,000 lb are available in revised bulletin.

Brochure contains both photographs and diagrams in two colors describing features of the equipment. A special page depicts a number of attachments which are available.

Bul 5101B is issued by Materials Handling Div., The Yale & Towne Mfg. Co., Dept. CP, 11000 Roosevelt Blvd., Philadelphia, Pa. When inquiring specify CP 8089 on handy Reader Service slip which is located between pages 2 and 3.

For more information on product at right, specify CP 8090 . . . see information request blank between pages 2 - 3.

# PROCESS EQUIPMENT NEWS

PUBLISHED BY FABRICATED PRODUCTS DIVISION, THE M. W. KELLOGG COMPANY

APRIL 1954

## EXCHANGER DESIGNED FOR HIGH PRESSURE DIFFERENTIAL

A pressure differential of approximately 1300 pounds per square inch across the tube sheet is one of the unusual conditions to be provided for in a carbon dioxide condenser currently under construction in Kellogg's fabrication shops for a leading chemical processor.

The condenser consists of two shells, 18 inches in diameter, of forged integral channel fixed tube sheet construction. The tubes, 250 per bundle, are of 3/4-inch admiralty, 20 feet long. The shell cover, channel, and tube sheets are all of steel.

In operation, water will circulate in the tubes at a design pressure of 80 psig. to condense approximately 30,000 lbs. per hour of carbon dioxide under a pressure of 1400 psig.

Just one of scores of exchangers, condensers, coolers, and reboilers that annually come out of its shops, this job illustrates one of an infinite number of extreme conditions Kellogg is experienced and equipped to meet in designing and fabricating process equipment.



## Fourteen Shells for Three Condensers to Have Interchangeable Bundles

Three condensers currently being engineered by Kellogg for a major refiner will represent an optimum in interchangeability of bundles—a feature every refiner wants but one that is often difficult to achieve in a unit without over-engineering it.

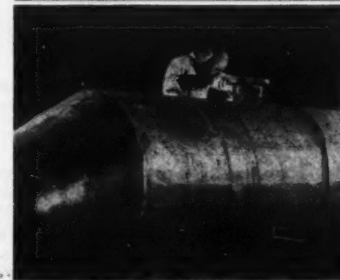
The three condenser units, designed to handle C-4 cuts, comprise a total of 14 shells. Following normal design practices, initial Kellogg engineering proposals included three sizes of shells. However, further study by Kellogg engineers proved, in this instance, that it would be most economical in the long run to design the entire group of 14 shells for interchangeable bundles. Both proposals were submitted, the customer agreeing that the interchangeable bundle plan best served their purposes.

Each of the 14 sections are of floating tube sheet construction with 2040 square feet of 3/4-inch admiralty tubes, naval brass tube sheets, and steel baffles. Inside diameter of each shell is 33 inches. The sections are all designed for 500 degrees F. on the shell side, 300 degrees F. on the tube side, and 300 psig. on one side.

Interchangeable bundles for this many sections will offer several im-

portant advantages to the refiner. They will, for example, cut down considerably on refinery maintenance stock, since only one spare bundle need be kept in stock to service any one of the 14 sections. Shorter down time for repairs are also expected to result from the fact that the spare bundle can be substituted easily in an emergency without shutting the unit down for lengthy repairs or rebuilding.

### ... An Exact Bevel



One of the two reflux reboiler shells being fabricated in Kellogg's Jersey City shop for a major petroleum refiner. Here a nozzle is being welded to the shell—the final operation that demands the utmost in precision. Holes for these nozzles have been cut with an exact bevel so that a perfect joint results when welding is completed.

## FABRICATED PRODUCTS DIVISION M. W. KELLOGG



EXCHANGERS

THIN WALL  
ALLOY  
PIPINGCLAD STEEL  
VESSELS

CONDENSERS

FRACTIONATING  
TOWERSPRESSURE  
PIPING

DIGESTORS



COOLERS



## A LOGICAL ANSWER FOR BETTER GREASES...

BETTER TALLOW FATTY ACIDS



Producers of lubricating greases are turning to high-quality, uniform "DISTAL 42". This distilled fatty acid is light in color, free of moisture, glycerine and protein. An extremely low linoleic acid content, the absence of triglycerides, and a low ester number make DISTAL 42 ideal for lubricating greases as well as hand cleaners, soaps, and chemical specialties.

CHECK THESE  
SPECIFICATIONS

Titre . . . . .	40 to 43°C
Acid Number . . . . .	200 to 205
Iodine Value . . . . .	40 to 60
Saponification Value . . . . .	201 to 206
Color (5 1/4" Lovibond) . . . . .	Max. 40Y/4.0R



Chart No.	Chart Title	Chart Description
1	Hydrofol Fatty Acids	Hydrofol Fatty Acids
2	Hydrofol Fatty Acids	Hydrofol Fatty Acids
3	Hydrofol Fatty Acids	Hydrofol Fatty Acids
4	Hydrofol Fatty Acids	Hydrofol Fatty Acids
5	Hydrofol Fatty Acids	Hydrofol Fatty Acids
6	Hydrofol Fatty Acids	Hydrofol Fatty Acids
7	Hydrofol Fatty Acids	Hydrofol Fatty Acids
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10	Hydrofol Fatty Acids	Hydrofol Fatty Acids

Available in drums or aluminum tank cars for immediate shipment. Samples and prices are available on request.

WRITE FOR FREE WALL CHART OF ADM "CHEMI-FATS."  
Easy-to-read tables give composition and specifications of 40 ADM Chemicals from Oils and Fats. (Chart is 17"x27")

ACIDS • GLYCERIDES • SPERM OILS • ALCOHOLS  
FROM VEGETABLE • ANIMAL • MARINE OILS AND FATS

### Other ADM Products:

Linseed Oil, Soybean Oil, Fish Oil, Paint Vehicles, Vinyl Plasticizers, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa Meal, Livestock and Poultry Feeds.

PRODUCED IN  
ANY QUANTITY

SAMPLES TO  
SHIPLOADS

ARCHER • DANIELS • MIDLAND COMPANY  
Chemical Products Division • 2191 West 110th St. • Cleveland 2, Ohio

When inquiring check CP 8091 on handy form, pgs. 2-3

## Convention & Exhibit

### Schedule

1954

Apr. 5-6. The Society of the Plastics Industry (Canada) Inc., 12th Annual Conference, Mount Royal Hotel, Montreal, Canada.

Apr. 5-8. American Management Association, 23rd National Packaging Exposition, Auditorium, Atlantic City, New Jersey.

Apr. 13. American Society for Testing Materials, New York District, Joint Meeting with TAPPI, New York City.

Apr. 14-16. American Chemical Society, Division of Rubber Chemistry, 65th meeting, Brown Hotel, Louisville, Kentucky.

Apr. 21-23. Southern Industrial Wastes Conference, The Shamrock Hotel, Houston, Texas.

Apr. 22. Conference on Instrumentation in Water, Sewage, and Industrial Waste Treatment, Civil Engineering Dept., Manhattan College, New York City.

Apr. 22. American Society for Testing Materials, New England District Meeting, Storrs, Connecticut.

Apr. 27. Association of Consulting Chemists and Chemical Engineers, Inc., Open Meeting, Hotel Belmont Plaza, New York City.

May 4-7. American Welding Society, National Spring Meeting, Hotel Statler, Buffalo, New York.

May 12-14. American Institute of Chemists, 31st Annual Meeting, Hotel Berkeley-Carteret, Asbury Park, New Jersey.

May 16-19. American Institute of Chemical Engineers, National Meeting, Kimball Hotel, Springfield, Mass.

May 17-20. Basic Materials Exposition and Conference, International Amphitheatre, Chicago, Illinois.

June 7-10. The Society of the Plastics Industry, Inc., Sixth National Plastics Exposition, Cleveland Auditorium, Cleveland, Ohio.

June 20-25. American Institute of Chemical Engineers, Special Meeting on Nuclear Energy, Ann Arbor, Michigan.

June 21-23. Chemical Institute of Canada, 37th Annual Conference and Exposition, Toronto, Canada.

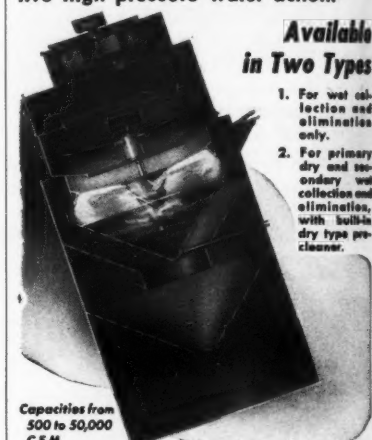
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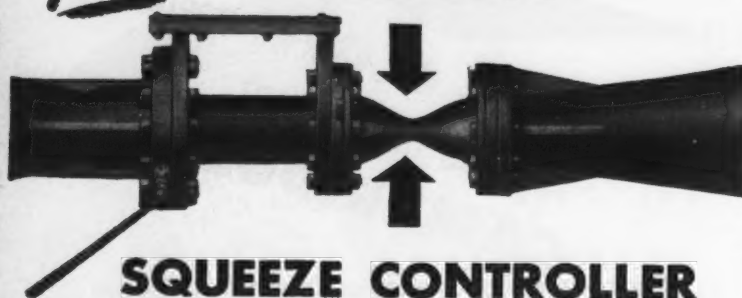
CHEMICAL PROCESSING

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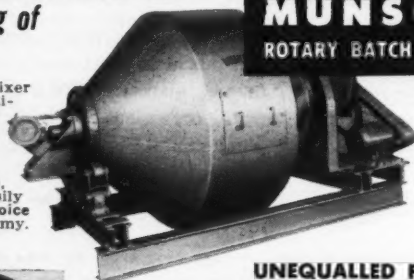
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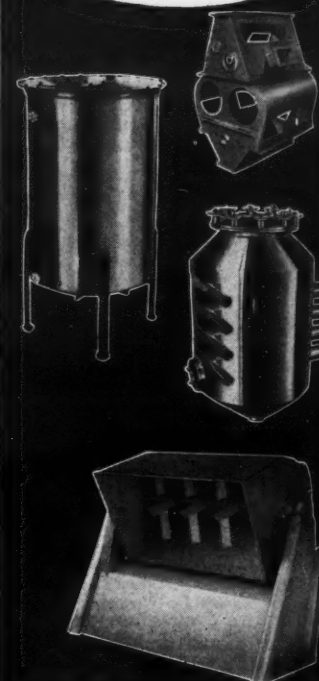
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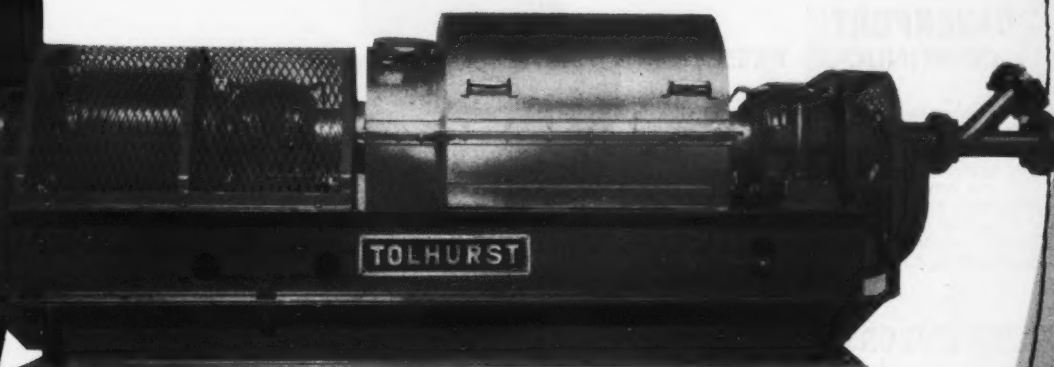
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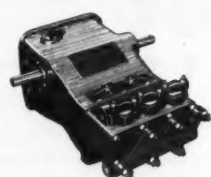
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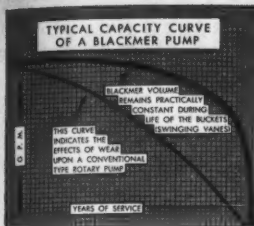
Literature, Samples and the name of your nearest distributor upon request.

For specific problems write or call our Technical Department

**ALCONOX, INC.**  
WETTING AGENT DETERGENT  
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CHEMICAL PROCESSING



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2. The Blackmer design also features replaceable cylinder liners enabling pumps operating under severe conditions or corrosion and abrasives to be renewed at minimum cost.
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4. The Blackmer pressure control valve, an integral part of the pump, provides minimum variation from set pressure and protects the unit against damage by accidental shut-offs in the discharge system.
5. Pumps are available with speed reduction equipment for operation by all types of power drives (Motors, Engines, Turbines, etc.)
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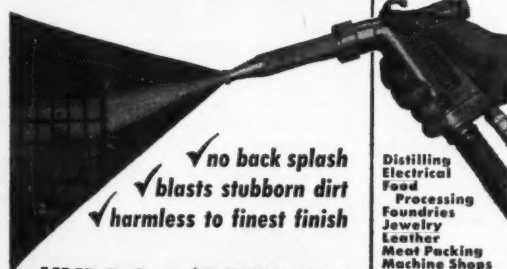
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 WASHER

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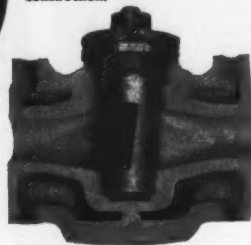
In Canada: APECO OF CANADA, LTD., 134 PARK LAWN ROAD, TORONTO, ONT.

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At left: Jacketed 3-Way Plug Cock.  
Below: Cutaway section of Jacketed Cock, showing packing gland construction.



## Jacketed Pipe, Pumps, Valves and Fittings ...



Jacketed Meter, with set-back register, for measuring viscous liquids.

### for maintaining uniform temperatures (hot or cold) in process pipes

Regardless of whether the material is being heated or cooled in the processing, and what heating or cooling medium is being used, H & B jacketed fittings are available for all applications. Steam, hot water or hot oil may be used for heating, cold water or brine for cooling.

H & B can save you money on your jacketed pipe and fitting requirements because we buy all standard size pipe from the mill in carload lots, make our own special flanges in quantities, and are tooled up for making jacketed equipment at lowest possible price. Write for Bulletin J-50.

**HETHERINGTON & BERNER INC.**  
711 KENTUCKY AVE. INDIANAPOLIS 7, IND.

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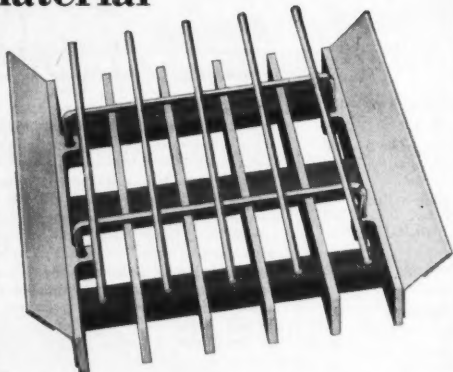
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You lay a Bauer Magnetic Grate on a frame in a hopper throat or floor opening. When flowable bulk materials go through the grate, all pieces of iron or steel are held in a firm magnetic grip.

The average sizes of Bauer Magnetic Grates range from 6 x 6 inches to 3 x 4 feet. They can be made in virtually all rectangular shapes and sizes wanted.

One of the grates can readily pay for itself by removing a bolt, nut, or spike from grain, nuts, seeds, fruits, coffee, tea, spices, sand, clay, lime, or other material. Such a metal object could readily start a fire or damage a machine.

The Magnetic Grate is fully ex-



plained in our Bulletin No. M-3A which also describes Bauer chute and table permanent magnetic separators. You'll want the information. So, ask for the bulletin now while you're thinking of it.

**THE BAUER BROS. CO.**

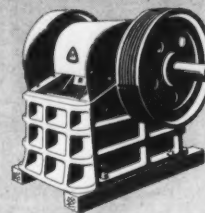
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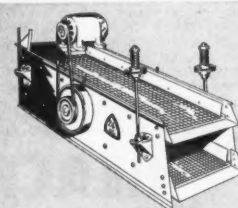


### DENVER JAW CRUSHER

Size: 5' x 6' to 32' x 40'.

Features: Steel frame, anti-friction bearings, manganese steel liners.

Price examples, 5' x 6'	\$ 581.00
less drives, 8' x 10'	1375.00
FOB Denver, 10' x 16'	2211.00

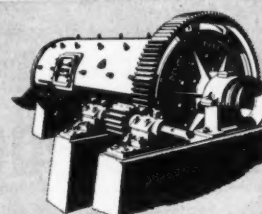


### DENVER-DILLON VIBRATING SCREEN

Size: 1' x 3', to 6' x 14'; 1, 2, 3 or 4 decks.

Features: 2 bearing drive, low H.P., all steel construction.

Price examples, 2' x 4'	\$ 600.00
less drive and screen cloth, Double Deck, 3' x 6'	1155.00
FOB Denver, 4' x 8'	1870.00



### DENVER STEEL HEAD BALL MILL

Size: 30" x 18" to 6' x 24'.

Features: Cast steel heads, cut tooth gears, protected trunnion bearings and manganese steel liners.

Price examples, 30" x 36"	\$1195.00
with liners, less drive and ball charge, 4' x 4'	\$156.00
FOB Denver, 5' x 6'	7986.00



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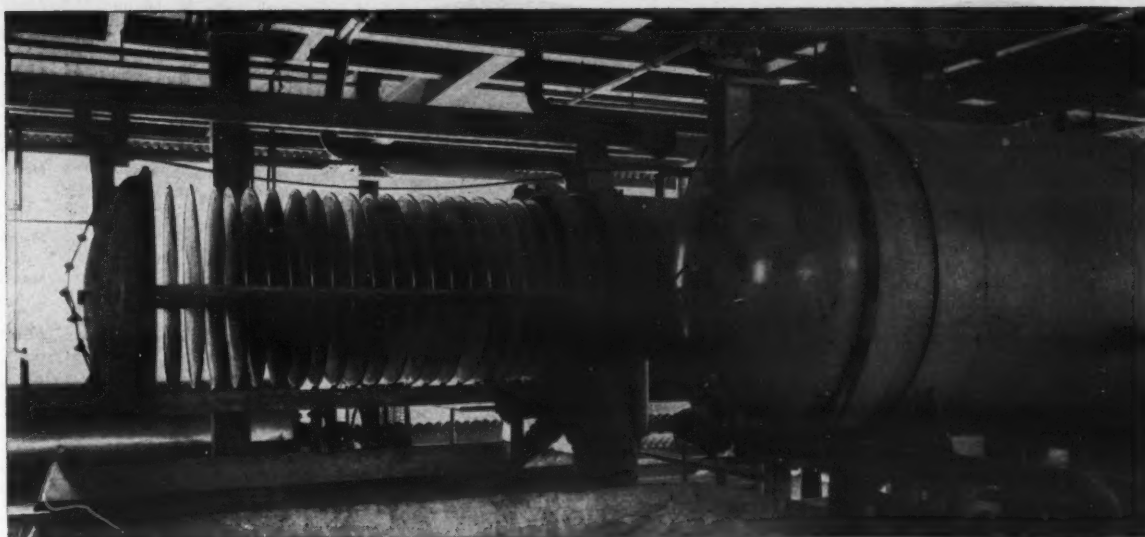
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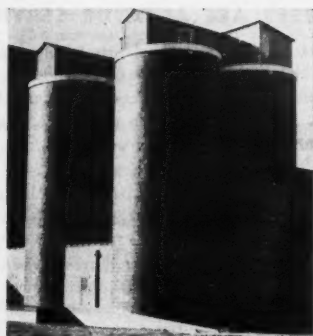
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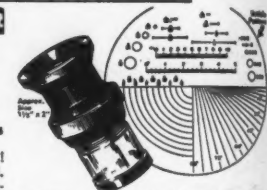
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CHEMICAL PROCESSING

## "That's Interesting"

### A reminder

With increasing attention being given to plant safety programs, on-the-job safety almost becomes second nature — which should be (but often isn't) taken home. A recent steel industry survey showed 45 per thousand off-the-job accidents serious enough to cause layoffs, while on-the-job accidents of the same type were only 17 per thousand. (The Power Specialist)

### Umbrella windows

Safety for children and adults alike in rainy weather is provided by a clear plastic window set in umbrellas made by Rainseth Umbrella Co., Inc. The window is of Kreen vinyl film (a product of Bakelite Co.) It's flexible, resistant to water, mold, and mildew, and is easy to clean. (Bakelite Review)

### Wire wonderland

As short a time ago as 1882, only 13½ miles of electric mains served 59 customers in New York City. The number of customers has now grown to 8½ million, and an imagination-staggering 50,000 miles of underground cable and 29,000 miles of overhead wire are needed to serve them. (C-A Newscast)

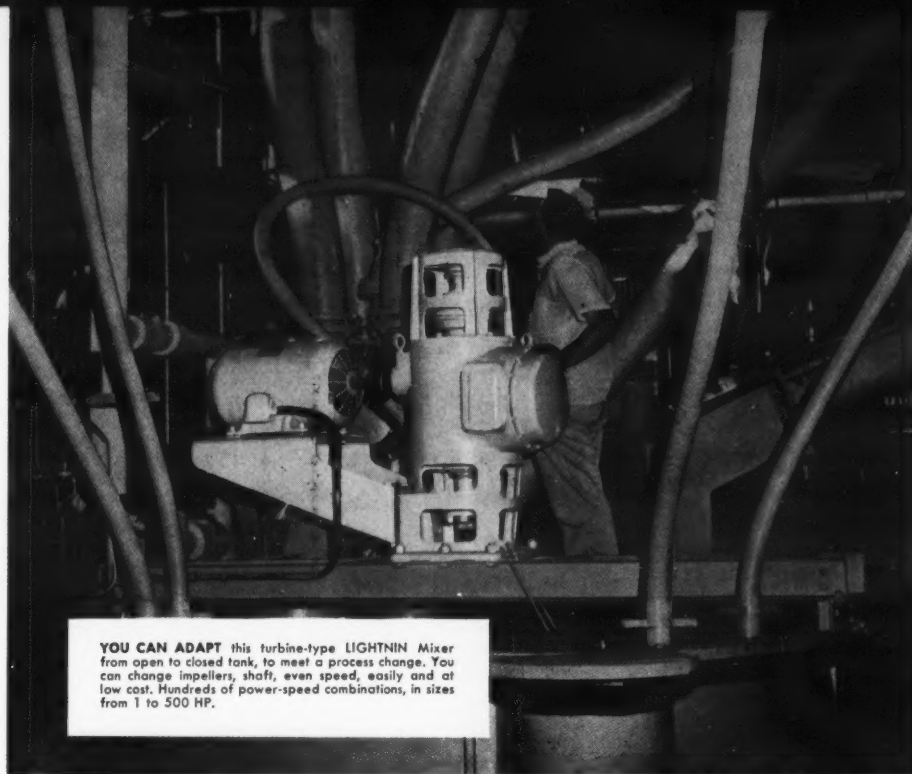
### Canned ice

You read right. The Kand-Ice Co., Nampa, Idaho, sells canned ice. The product is really a can which, after the contents are frozen, provides a source of dry, sanitary refrigeration. It can be re-used and should prove handy for fishermen, hunters, motorists, and picnickers. (Design News)

### Gone, but not forgotten

Once the dentist has yanked that ailing bicuspid, its service to the individual does not always end. Often the teeth are sent to some dental laboratory, such as that of Bristol-Myers in Hillside, N.J., to serve the research that leads to better dentifrices that will enable us to keep those teeth that remain.

For more information on product at right, specify CP 8116 ... see information request blank between pages 2-3.



**YOU CAN ADAPT** this turbine-type LIGHTNIN Mixer from open to closed tank, to meet a process change. You can change impellers, shaft, even speed, easily and at low cost. Hundreds of power-speed combinations, in sizes from 1 to 500 HP.

Photo courtesy International Minerals & Chemical Corporation.

## Choose a fluid mixer that grows with your process

Today, this mixer is churning up 5,000 gallons of a phosphoric acid slurry.

Tomorrow, with a few simple changes, the same mixer may be lifting and distributing solids throughout 3,000 gallons of heavy prefill slurry.

Or it may be whirling millions of pin-point gas bubbles into intimate contact with 10,000 gallons of fermentation broth.

Provided the horsepower requirements are not too different, you can often switch a LIGHTNIN Mixer from one operation to another, at far less than the cost of a new mixer.

### 7 ways to beat obsolescence

You can change the mixer mounting from open-tank to closed pressure vessel, and vice versa. You can get a new mounting to fit any tank nozzle.

You can switch from standard to low-headroom mounting, from top entering to bottom entering.

You can change shafts—even increase or decrease shaft diameter—to meet new torque requirements.

You can change size and shape of impellers—and know in advance what your results will be.

And with many LIGHTNIN Mixers,

you can change speed—quickly, simply, without dismantling the mixer or even removing it from the tank. Many of these units give you a choice of up to 16 standard interchangeable speeds.

This versatility helps you beat the high cost of obsolescence in your plant. It is just one of the reasons why LIGHTNIN is the best choice you can make for mixing fluids.

**For quick, competent help on fluid mixing—and guaranteed results—call in your LIGHTNIN representative. Or write us today.**

## Lightnin Mixers

**GET THESE HELPFUL FACTS ON MIXING** LIGHTNIN Catalogs contain practical data on impeller selection; sizing; best type of vessel; installation and operating hints; full description of LIGHTNIN Mixers. Yours without obligation. Check and mail coupon today.

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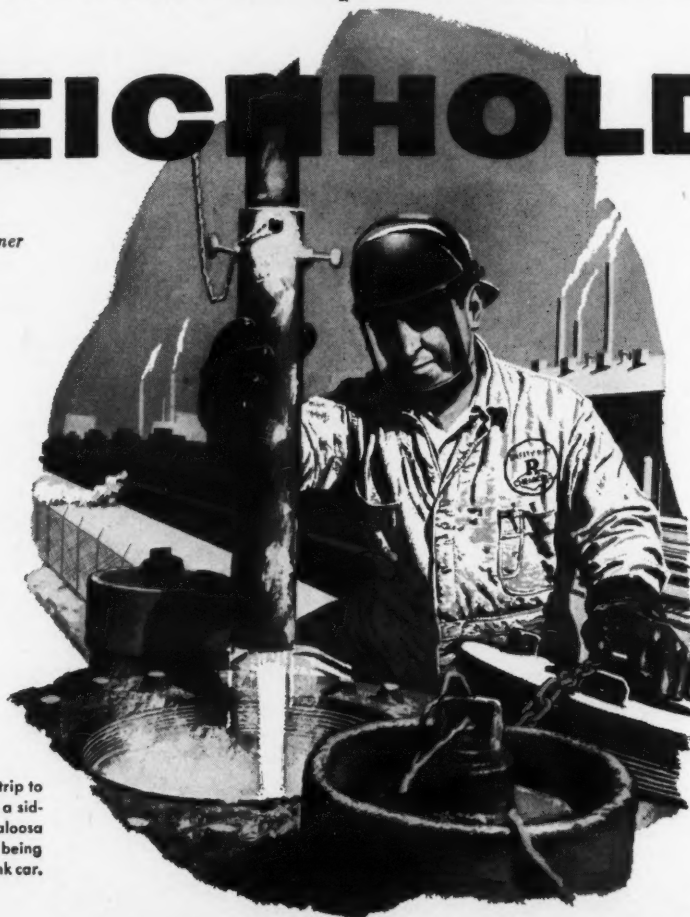
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